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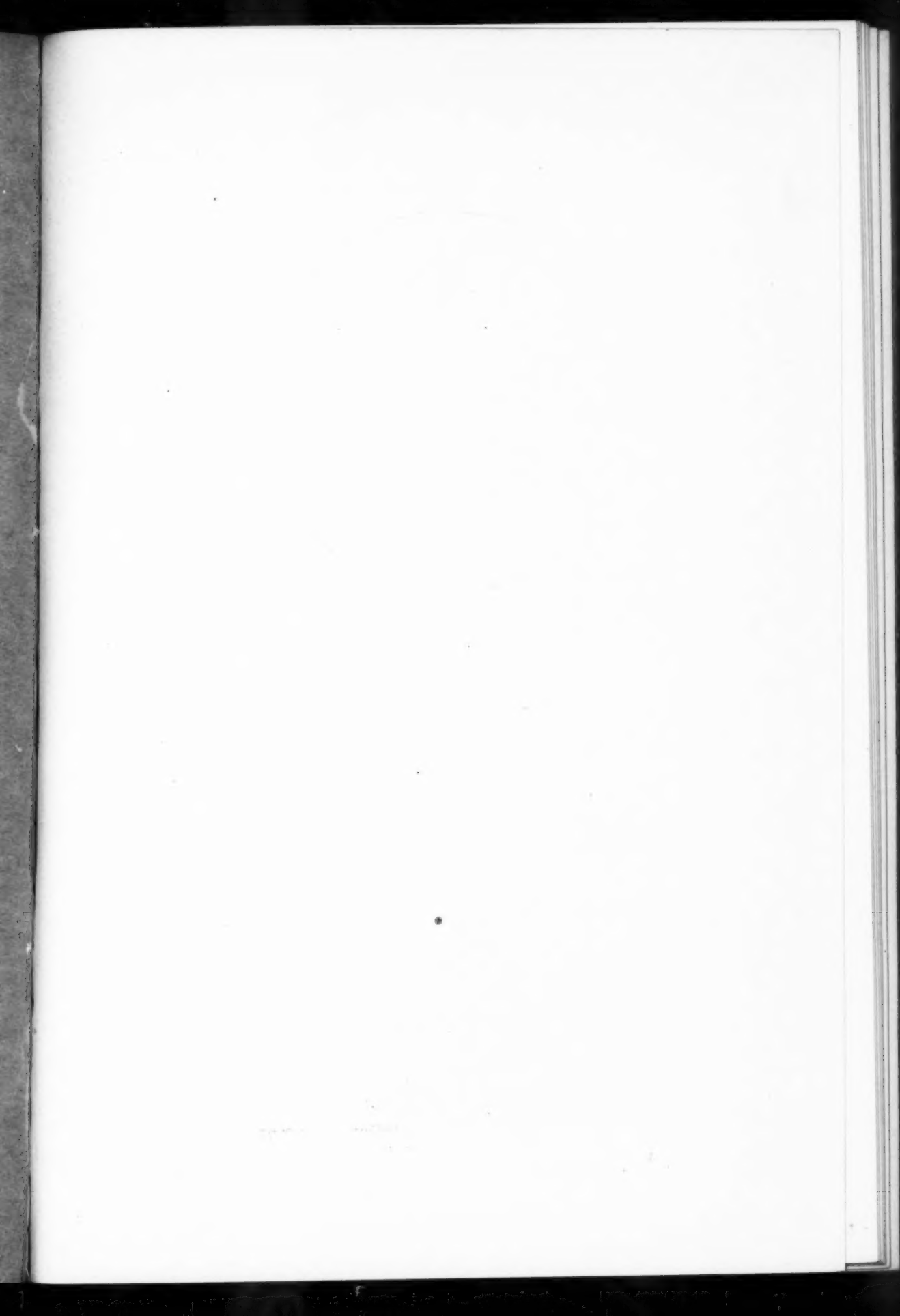




FIG. 1. HYALOID ARTERY AND CANAL OF CLOQUET.  
LEFT EYE, ERECT IMAGE. (DANIS' CASE 1.)



FIG. 2. PERSISTENT HYALOID ARTERY AND CANAL OF CLOQUET.  
LEFT EYE. (DANIS' CASE 1)



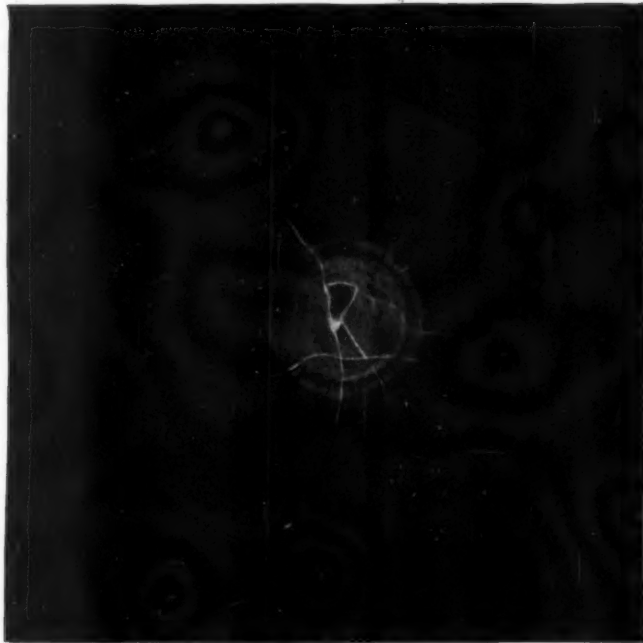


FIG. 3. NEUROGLIAL REMAINS ON THE PAPILLA, EPIPAPILLARY MEMBRANE. RIGHT EYE, ERECT IMAGE. (DANIS' CASE 2.)



FIG. 4. ANOMALOUS PROLONGATION OF THE LAMINA CRIBROSA. RIGHT EYE, ERECT IMAGE. (DANIS' CASE 3.)



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## CONGENITAL ANOMALIES OF THE FUNDUS OF THE EYE.

MARCEL DANIS, M. D.

BRUSSELS, BELGIUM.

This paper reports the ophthalmoscopic appearances found in three cases. In one there was a persistent hyaloid artery and visible canal of Cloquet. In the others there was present a membranous, more or less opaque structure, in front of the disc. This was designated in one case an epipapillary membrane and in the other an anomalous prolongation of the lamina cribrosa. Color plates 4 and 5 show the appearances observed. Read before the Belgian Ophthalmological Society, November 28, 1920.

### PERSISTENT HYALOID ARTERY AND CANAL OF CLOQUET

CASE 1. R. Frederic, aged 24 years, presented a divergent strabismus, the left eye deviating outward; its vision reduced to counting fingers at 1 meter and not improved by lenses. Its refraction is myopic and 3 D. of astigmatism (horizontal meridian — 12 D., vertical — 15 D.) The pupil reacts to light, the iris presents no lesion, and is of a light blue color identical with that of the iris of the right eye. The external membranes are normal.

The ophthalmoscopic image of the left eye presents the following peculiarities (see plate 4, Fig. 1).

The papilla is covered by a flask-shaped mass, a little larger than the normal papilla, protruding to about 4 diopters, of a pale pink color, the center presenting a slight depression from which comes out a vessel, passing over the flask and directing itself downward. This vessel gives off a branch that turns outward. The upper nasal part of the flask is slightly narrowed and extended in a light red mass or convex band which widens little by little, and may be traced to the upper nasal part of the eyeball, where it seems to penetrate into the vitreous and become less and less distinct.

At  $1\frac{1}{2}$  d.d. from the depression in the flask from which the vessel emerges, as above mentioned, the band presents a bluish white cord. It then divides into two branches, one contin-

uing in the original direction, the other turning obliquely inward and itself dividing into other branches, which lose themselves after a short course in a spot of choroiditis. The first branch may be followed a long distance toward the upper part of the vitreous to the limits of the ophthalmoscopic field.

The band-like mass shows on its temporal and nasal sides vessels which give off branches to the temporal and nasal portions of the retina, the last branch following the direction of the white bands. At the flask-like dilatation these vessels appear to sink into the mass and can be seen in it with difficulty.

About the place where one should find the papilla, and along the borders of the ribbon-like mass, exist foci of choroiditis with strongly pigmented spots. Other little foci are disseminated in the fundus of the eye. One of the vessels after leaving the band-like mass presents a perivascular pigmentation. The choroid in general is poor in pigment.

Examination of the crystalline lens also reveals anomalies (see Fig. 2). After maximum dilatation of the pupil one sees on the posterior surface in the upper nasal quadrant a white star resembling in appearance shreds of asbestos. From a central point go out numerous rays of unequal size, of which two longer ones are directed downward. Examined with the Czapski-Gullstrand microscope, the star pre-

sents a concavity forward and is clearly localized in the posterior crystalline. The anterior part of the vitreous contains numerous mobile filaments which have a point of attachment to the star described.

The right eye is normal and presents no lesion.

The ophthalmoscopic picture described above resembles much that published by Finnoff (A. J. O., v. 3, March, 1920), who stopped with the diagnosis of a congenital anomaly without being more specific. I think that our case and that of Finnoff are both cases of persistent hyaloid artery and canal of Cloquet. The white band-like mass constitutes what is called the canal of Cloquet and the bluish-white cord the hyaloid artery. The star in the posterior part of the lens is the anterior termination of the artery, from which little branches still float in the vitreous. The hyaloid artery is obliterated.

Eversbusch, von Reuss and Manz give as characters distinctive of the canal of Cloquet: The existence of an enlargement at the position of the papilla of a volume notably greater than that of the vessels, which resolves itself into membranes that have no connection with the crystalline. Our band-like mass presents well all these characters. According to the same authors the hyaloid artery should conform to the following conditions: Taking its origin on a central retinal vessel having a caliber approaching that of the retinal vessels, and being in relation with the posterior surface of the crystalline lens. Except the first condition, which is not visible because of the prepapillary flash-like dilatation, the two other characters exist with regard to the bluish-white cord. According to Prof. Van Duyse the visible canal of Cloquet should present at its posterior extremity a funnel-like dilatation or a vesicle known by the name of "hammer-like area". The free papillary flask of our case furnishes this last condition.

One of the characters claimed by Hirschberg, the lighter coloration of the side presenting the anomaly, is

lacking. The persistence of the canal of Cloquet is an anomaly not very frequent, and the interpretations to which it has given rise are sufficiently numerous.

By Eversbusch it is made a post-embryonic modification of the central lymphatic space of the vitreous or the remains of previous hemorrhages to which the eyes of myopes would be subject.

According to Bach and Hess the canal of Cloquet is formed from the sheath of the unabsorbed loose cellular tissue surrounding the hyaloid artery, in fact, a lymphatic sheath thru the persistent artery.

By Hirschberg, De Beck and Van Duyse it is regarded as the thickening of the connective tissue surrounding the hyaloid artery. It is also the opinion of Parsons that the canal of Cloquet is due to the persistence of the cellular sheath of mesodermic origin surrounding the artery and found in a space limited by a hyalin membrane.

By all these authors, therefore, the canal of Cloquet is regarded as of mesodermic origin.

The embryologic work of Wolfrum, Krückmann, Seefelder, Magitot and Mawas has thrown a new light on the origin of the canal of Cloquet. The hyaloid artery during its course in the optic nerve is surrounded also by a sheath of one layer of epithelial cells. In front of the level of the papilla these cells form a mass occupying the funnel formed by the bend of the nerve fibers. This cellular mass extends laterally on the papilla gradually thinning out.

In its course thru the vitreous the hyaloid artery is equally surrounded by a layer of epithelial cells taking its origin on the papilla from a large base corresponding to the periphery of the papillary mass. This sheath contracts in penetrating the vitreous and presents then the form of a funnel, the "hammer-like area." In proportion as the hyaloid artery penetrates the vitreous body this cellular sheath approaches the artery but never fuses with it. There exists between them a space traversed by fine protoplasmic

prolongations. The sheath accompanies the artery during a certain part of its course and seems to disappear at a certain level. Mawas and Magitot have, however, been able to recognize on all the branches of the hyaloid artery, however small, cells of the same character as the cells of the sheath. These extend as far as the endothelium of the vessels and are united to them by the ends of the protoplasmic processes. It is at the fifth month of intrauterine life that the sheath attains its maximum development, and begins to diminish in thickness, to disappear generally at the time of birth.

By appropriate staining Seefelder was able to demonstrate that this sheath is of ectodermic origin and by its histologic structure that it is a neuroglial tissue. The periarterial sheath in the nerve and in the vitreous and the epipapillary cellular mass are developed from the same tissue. All these observations of Seefelder have been completely confirmed by the work of Mawas and Magitot.

The persistence of this glial coat, its exaggerated development even to the anterior pole of the eye, and its failure to atrophy with increase of the space between it and the hyaloid artery offers a rational interpretation of the ophthalmoscopic image called persistence of the canal of Cloquet. This interpretation is essentially that of Vasseaux, Bach, Hess, De Beck, Van Duyse, Hirschberg and Parsons with this difference: that it is the persistence of hypertrophy of ectodermic tissue, while these authors last mentioned make it a mesodermic formation.

Our case seems interesting from other points of view: The abnormal situation, passing upward, of the artery and canal of Cloquet is exceptional. Hoorens has shown to the Belgian Ophthalmological Society a case in which the canal of Cloquet had a similar direction. It appears that a fetal retinitis localized at the upper inner side of the retina may produce an adhesion between the hyaloid artery and its sheath, on the one part, and the retina on the other part. As we

have pointed out in the description of the case there existed numerous foci of choroiditis, the larger of which were localized along the canal of Cloquet. The hypothesis of Van Duyse that the deviation is due to an old inflammatory exudate may be accepted.

The anterior termination of the artery on the crystalline lens is very interesting, for its distinctness. It recalls the star, the radiating figure given by Van Duyse in a case of termination of the artery upon the crystalline lens. The excentric position is evidently due to the same cause as the abnormal position of the artery. The division of the artery into three branches visible by ophthalmoscopic examination is equally exceptional. A final interesting detail is the abnormal course of the retinal vessels. Instead of expanding on the retina at the margin of the papilla they appear to have been carried away by the glial coat of the hyaloid artery. Two vessels seem to follow the normal course, and one has been able to pass thru the prepapillary flask and return to its proper direction. The others follow the direction of the canal of Cloquet and are situated at first in the deep layers afterwards reaching the surface. The lateral branches which they give off bend at right angles to reach immediately the retina. To what is this abnormal direction due? Is it not hypertrophy of the neurologia which has mechanically prevented the vessels from following the normal path in the course of their development? The cases of Finnoff and that of Kipp present a similar vascular distribution.

#### EPIPAPILLARY MEMBRANE

CASE 2. D. Gerard, aged 23 years, presents in the left eye a typical coloboma of the iris. The refraction is hyperopic 1 D. The vision is normal and there exists no lesion of the deep membranes of the media.

The right eye is hyperopic 1 D., and has vision equal 0.4. The optic disc is red, and the vessels not visible upon it. At the center there is a small white mass from which proceed several white thread-like prolongations; two go up



and to the nasal side and two downward. These filiform prolongations terminate on the retinal arteries in slender points. The disc appears to be covered with a thin nontransparent veil (see Fig. 3, Plate 5). Examination with the large binocular ophthalmoscope of Gullstrand gives clearly the impression of a thin opaque veil covering the papilla which is thicker at the position of the thread-like prolongations.

#### ABNORMAL EXTENSION OF THE LAMINA CRIBROSA

CASE 3. Van M. René, 25 years old, was hyperopic 3 D. in the right eye with vision 0.5 after correction. The ocular media are normal. On ophthalmoscopic examination one finds on the disc between the center and the nasal margin, in the horizontal diameter, a brilliant white mass directed upward and outward and partly covering the disc; and forming a bridge over the upper nasal vein a little in front of its entrance thru the lamina cribrosa. After having covered that vein the mass spreads out in a fan covering all the upper quadrant and passing over the superior temporal artery and vein to about the same distance as along the superior nasal vein. Another bifid prolongation is directed to the temporal side. This mass presents no striation. (See Fig. 4, Plate 5).

The left eye is astigmatic, hyperopic and amblyopic, but without lesions of the deep coats.

#### COMMENT

Case 2 corresponds in its ophthalmoscopic appearances to the picture of epipapillary membrane, and Case 3 to that known under the name of abnormal extension of the lamina cribrosa of Masselon. The origin of these membranes and extensions has been strongly discussed. Masselon agrees that it was Fuchs who first described a case in which the middle part of the disc was covered by a brilliant white spot, which only feebly permitted the perception of the underlying vessels. A spot formed by a thin veil of uncolored

tissue probably connective tissue. Randall has reported several cases but without an explanation of their origin.

According to Masselon these structures are of connective tissue origin. They may proceed from the central connective tissue strand of the lamina cribrosa, or the fibrous tissue of the sclerotic; or the connective tissue fibres of the choroid.

This is the reason he has given to this anomaly the name of abnormal extension of the lamina cribrosa.

Berger considers these formations as results of a neuroretinitis which has run its course during intrauterine life.

According to Eversbusch they arise from an excessive development of the papilla with thickening of the adjacent part of the limiting membrane following inflammation during fetal life.

Wintersteiner assumes that the retina has presented folds which are not effaced and which change into connective tissue.

Most authors, however, think that the appearance under discussion is that of embryonic remains. Bauer, Hirschberg, von Szily, Mayeda, Vossius, Parsons, Van Duyse, De Beck, Reuss, consider these extensions or veils as remains of the hyaloid vessels, and the connective tissue membranes which ensheath them.

According to Oeller they are the remains of the sheaths of hyaloid vessels in the nature of neuroglia.

We come to see apropos of the persistence of the canal of Cloquet that the funnel of nerve fibres at the level of the optic disc is occupied during fetal life by a mass of neuroglia cells, that this mass spreads out over the whole nerve head and that the margins thin out while the other part of the hyaloid artery is covered with a sheath of neuroglia in the shape of a funnel, the base of which covers the disc while its extremity gradually approaches the artery.

It is the persistence of this funnel which seems to me the best explanation of Case 1, the persistence of the hammer-like part of the canal of Cloquet.



As the retinal vessels emerge from the epipapillary mass it is not strange that they are completely covered, following the nonabsorption of the mass and of the neuroglia funnel.

The filiform prolongations are probably part of the thickening of the neuroglia tissue at the place of the vessels. In the third case on the contrary only a part of the epipapillary

neuroglia is absorbed, while the remainder is retained.

We conclude that the canal of Cloquet, epipapillary membrane and extensions of the lamina cribrosa are essentially identical congenital malformations, all three dependent on a hyperplasia and a nonabsorption or incomplete absorption of the hyaloid neuroglia tissue.

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## PROLONGED MONOCULAR OCCLUSION AS A TEST FOR THE MUSCLE BALANCE

F. W. MARLOW, M. D.

SYRACUSE, N. Y.

This paper describes the method of occlusion and emphasizes the need for making it complete and prolonged. It reports graphically striking results in the unmasking of heterophoria not discovered by other methods. Read before the American Ophthalmological Society, June, 1920.

The method to which the title of this paper refers is an extension in point of time only of the screen or cover test. It has been put in practice by replacing one of the patient's lenses by a ground glass, it being found necessary occasionally, on account of the annoying glare from the latter, to paste a piece of dark paper over the back of it, or to substitute a black patch for it. The ground glass is used on account of its comparative inconspicuousness, but a black patch is much less annoying to wear. A full refractive correction is worn over the other eye.

The object of the test is explained in detail to the patient, and it is scarcely necessary to state that only those who combine sufficient intelligence to understand it with a realization that the problems presented by their cases are obscure, and a genuine desire to give all possible assistance in solving them are fit subjects for it. As a matter of fact patients of this class are very numerous. I have been surprised at the willingness, even eagerness, with which it has been accepted by patients, and at the conscientiousness with which it has been almost invariably carried out.

The directions given to the patient are that he shall put the glasses on in the morning before opening his eyes, that he shall not look over or under them, that if he wishes to remove them for any purpose during the day he shall close his eyes, or at least one of them before doing so, and replace the glasses before reopening them, and that he shall wear them until after he has closed his eyes at night. In other words, that one eye shall not be allowed to associate with the other during the whole period of the test. Strict continuity is apparently a very impor-

tant detail. It was my good fortune to come across a case previously in the hands of one of my colleagues, in which sufficient emphasis had not been laid upon this point.

Thru his courtesy I am able to give the results of a seven and also a fourteen-day occlusion test in which the patient did not put his glasses on until after dressing.

Before the first occlusion test examination showed an exophoria of one-half degree and no hyperphoria.

After the seven-day test the exophoria rose to one and one-half degrees, and there was a left hyperphoria of one and one-quarter degrees.

After the fourteen-day test the exophoria was two degrees, and the hyperphoria three degrees.

A ten-day test without any break in the continuity gave exophoria seven degrees, and L. hyperphoria three degrees.

At the end of the period of occlusion, or whenever a test of the muscle balance is made during it, a full correction of the refraction is placed in a trial frame, with a Maddox rod or whatever other means is selected for the test, the patient is directed to close his eyes, his glasses are removed and replaced by the trial frame. He is then directed to open his eyes, and the test is made, without any break in the continuity of occlusion. It is my usual practice to use the Maddox rod for the vertical, and the phorometer or vertical diplopia test for the lateral deviations, with the screen or parallax test as confirmatory. The difference between these tests is not always in favor of the screen test, and is negligible compared with the changes occurring under prolonged occlusion.

The choice of the eye to be covered is usually determined by finding out

which eye the patient uses for pointing or aiming at a distant object, and occluding the other, or if one eye is defective, by occluding that.

I have used this method occasionally for about twenty-five years, with increasing frequency during the last ten or twelve years and have notes of about five hundred cases.

In the earlier cases the observations were limited to the changes in the position of rest for 6 meters, but in some of the later ones have been extended also to the abduction, near point of convergence, and the balance at 1/3 meter before and after occlusion, and also to the distribution of the hyperphoria over the field, chiefly after occlusion.

In the majority of cases the muscle balance has been determined at the beginning and end of the period of occlusion only; but in a number, daily observations have been made for the purpose of getting information as to how long it takes for the muscles to relax, and to arrive at stability. Some of the cases seem to suggest that this happens within a week, but repetition of the test in others shows that a week's occlusion may leave a good deal of error latent. A study of the charts to be shown will leave but little doubt that a period of several days at least is necessary to bring about a sufficient relaxation of the muscles.

In most cases the period of occlusion has been for seven days. It should be stated that this method has been used only in those cases in which the correction of the refraction, and such faults in the muscle balance as can be detected by the ordinary methods, has failed to relieve the symptoms or has aggravated them.

The cases may be divided roughly into the following groups on the basis of the results obtained:

1. Those in which no change occurs in the relative position of rest.
2. Those in which an error is found that was not demonstrable before occlusion.
3. Those in which the error found before is increased to a greater or less extent after occlusion.

4. Those in which there is a reversal in the form of deviation, right changing to left hyperphoria, or esophoria to exophoria.

5. Those in which there is a reduction in the amount of error.

What changes take place in exophoria are in the direction of increase. In the majority of cases the near point of convergence is normal before, and remains normal after occlusion.

Esophoria sometimes diminishes or even changes to exophoria, and sometimes increases.

In hyperphoria the changes may be in the direction of increase, decrease, or reversal. When reversal takes place, it is usually accompanied by the development of exophoria.

The youngest patient in whom the test was made, showing a latent error, was eleven years old, and the oldest seventy-eight. In another case there seems little doubt that the error was present at five years of age and causing symptoms, tho the test was not made until nine years later.

I present a series of 73 charts, ten of which are herewith reproduced, showing at a glance the main changes which have taken place in the cases they represent.

The chief conclusions suggested by the observations made by this method is that the period of time for which the binocular function is usually annulled during tests for the muscle balance is too short to permit the desired relaxation of the muscles to take place. The length of time necessary to bring out the error seems to vary in different cases; but it is evident that in many a seven-day period is enough to furnish valuable information.

In the second place it is evident that the tests as ordinarily used may not only fail to show how much error is present, but may also be misleading as to its character.

Third, that the paralytic or nonparalytic nature of a hyperphoria becomes much more apparent after the test than before, a very large majority being of the former character. In many cases, even in those in which there is a normal equilibrium in the primary posi-

tion, evidence is found in the oblique positions of insufficiency of one, and somewhat commonly of both inferior recti, and the same applies, perhaps less frequently, to the other muscles.

Fourth, that there is no constant relation between the prism duccion and the muscle imbalance, at any rate so far as abduction and exophoria are concerned; as the latter after occlusions frequently exceeds, sometimes very greatly, the abduction as measured before occlusion.

Fifth, that the opinion that the constant wearing of prisms tends to increase a deviation receives no support from these observations, far more rapid and extensive changes being brought about by prolonged annulment of the binocular function.

Sixth, that the frequent failure to relieve symptoms by the constant wearing of prisms is explained in part by the fact that the total error may greatly exceed the manifest, and that such prisms as can be worn offset too small a fraction of the total error to make any appreciable difference.

Seventh, a few observations seem to indicate that the effect of prism exercises is to obscure or render latent an error previously manifest, this error being easily brought out again by an occlusion test.

Eighth, that the effect of a tenotomy cannot be measured without an occlusion test both before and after operation.

#### EXPLANATION OF CHARTS

X indicates a lateral deviation; above the zero line, exophoria; below, esophoria.

O indicates a vertical deviation; right hyperphoria above; left below the line.

X O on zero line, orthophoria.

P P C, punctum proximum of convergence, measured from base line.

Occ. Occlusion.

Hyp. Hyperphoria.

In the measurement of abduction the higher number indicates the point at which diplopia occurs, the lower the point at which fusion returns.

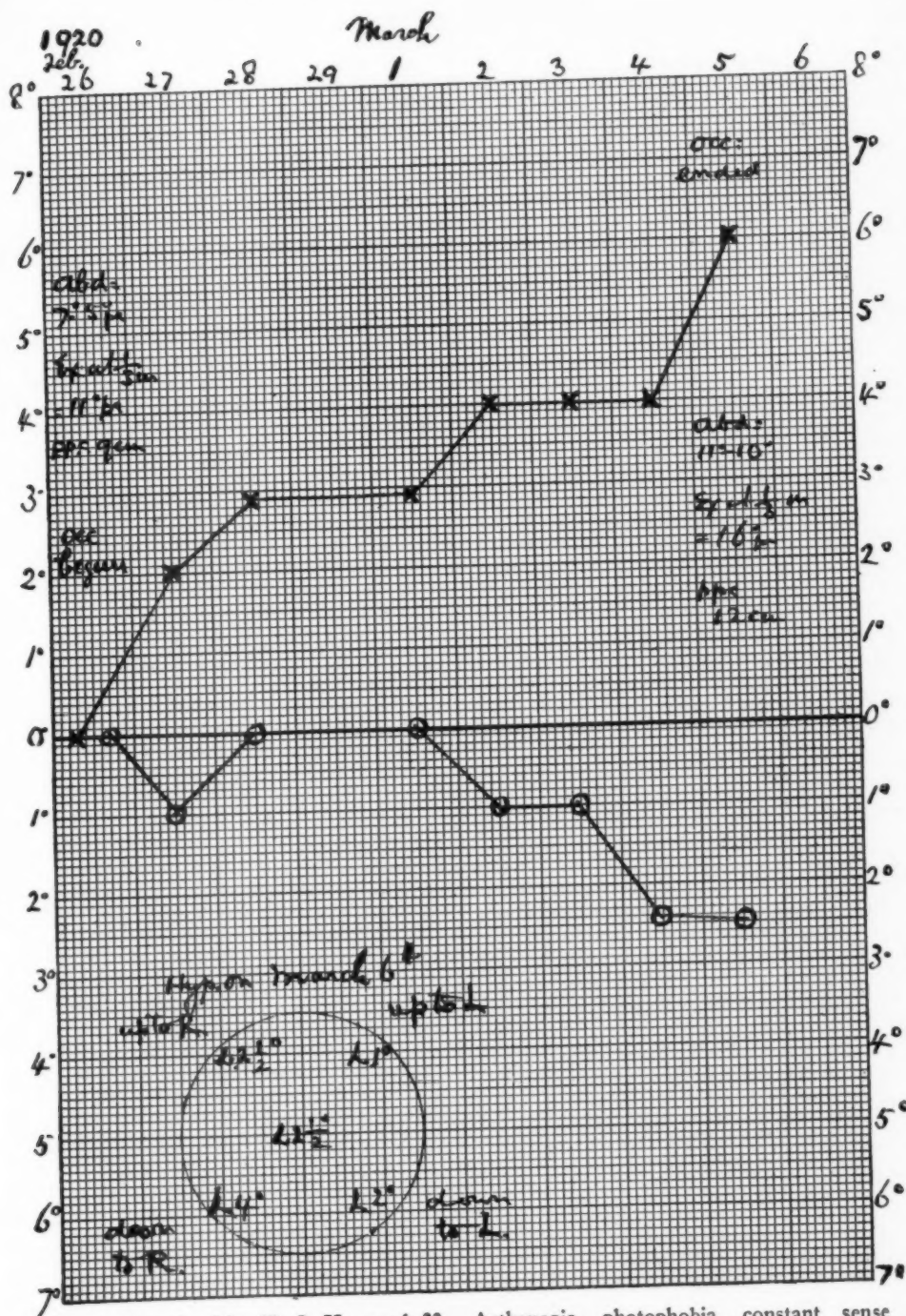


Fig. 1, Case 1. Mr. H. J. H., aged 33. Asthenopia, photophobia, constant sense of strain. Has consulted eight oculists without benefit.  
 Wearing: Right + 1. sph. + 1.25 cyl. axis 95°; left + 1. sph. + 1.00 cyl. axis 75°.  
 Accepts under scopolamin: Right + 1. sph. + 1.37 cyl. axis 100°; left + 1. sph. + 1.25 cyl. axis 67.5°. Obtained great relief by prism correction.







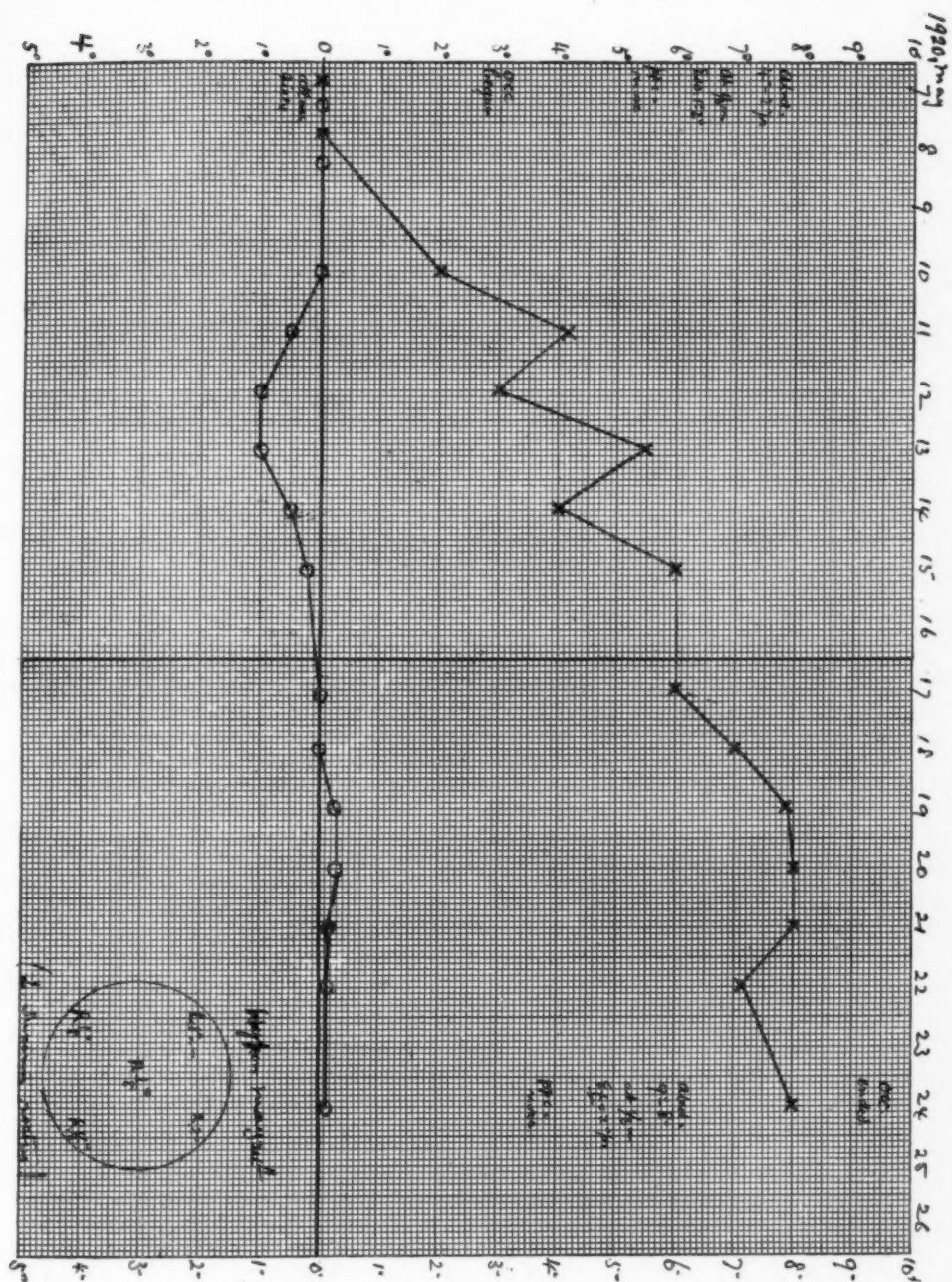


Fig. 3, Case 3. (52.24). Mr. S. R. M., 44.

Headaches and nervousness.

When first seen in 1901 showed Esophoria 3°, and R. Hyperphoria ½°.

Refraction 1919: Right + 1. + 0.12 cyl. axis 150°; left + 1. + 0.12 cyl. axis 55°.

Note that addition of twenty-four hours produced no change in muscle balance that it took three days to bring out 2° of Exophoria, and twelve days to arrive at stability. Also that the final Exophoria is at least double the primary abduction.



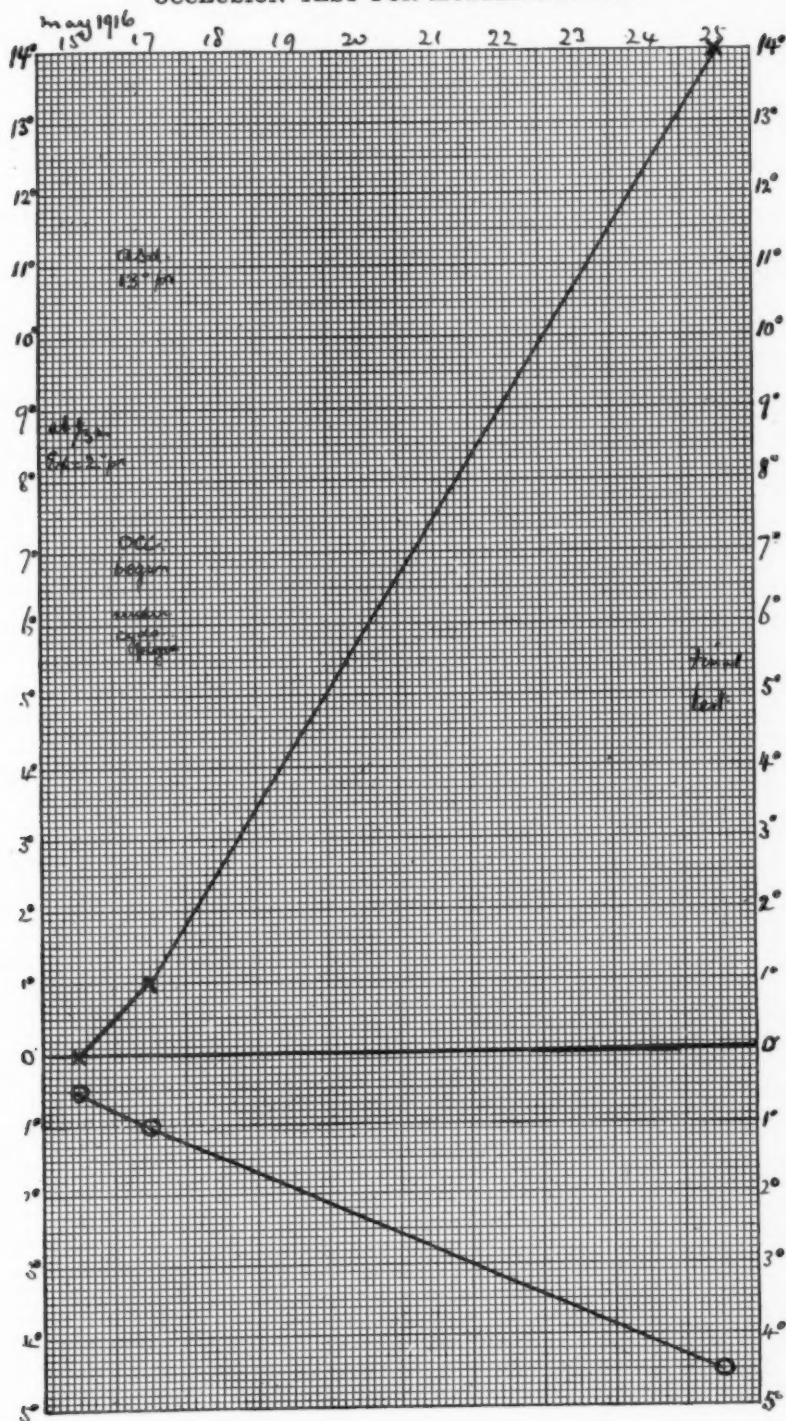


Fig. 5, Case 5. Mrs. C. A. T. (4737).

Always subject to sick headache once in six weeks, requiring hypodermics. Constant headache in the intervals. Asthenopia, photophobia. Examined many times and operated on in Pittsburgh in 1898, without benefit. Now glasses for several years. Under cycloplegia: Right Em; left 0.50 sph. She had Esophoria 7°, and L. Hyperphoria 1½°, and a partial tenotomy on the left inferior rectus and free tenotomy of left inferior rectus. To illustrate unknown effect of tenotomy without occlusion test.



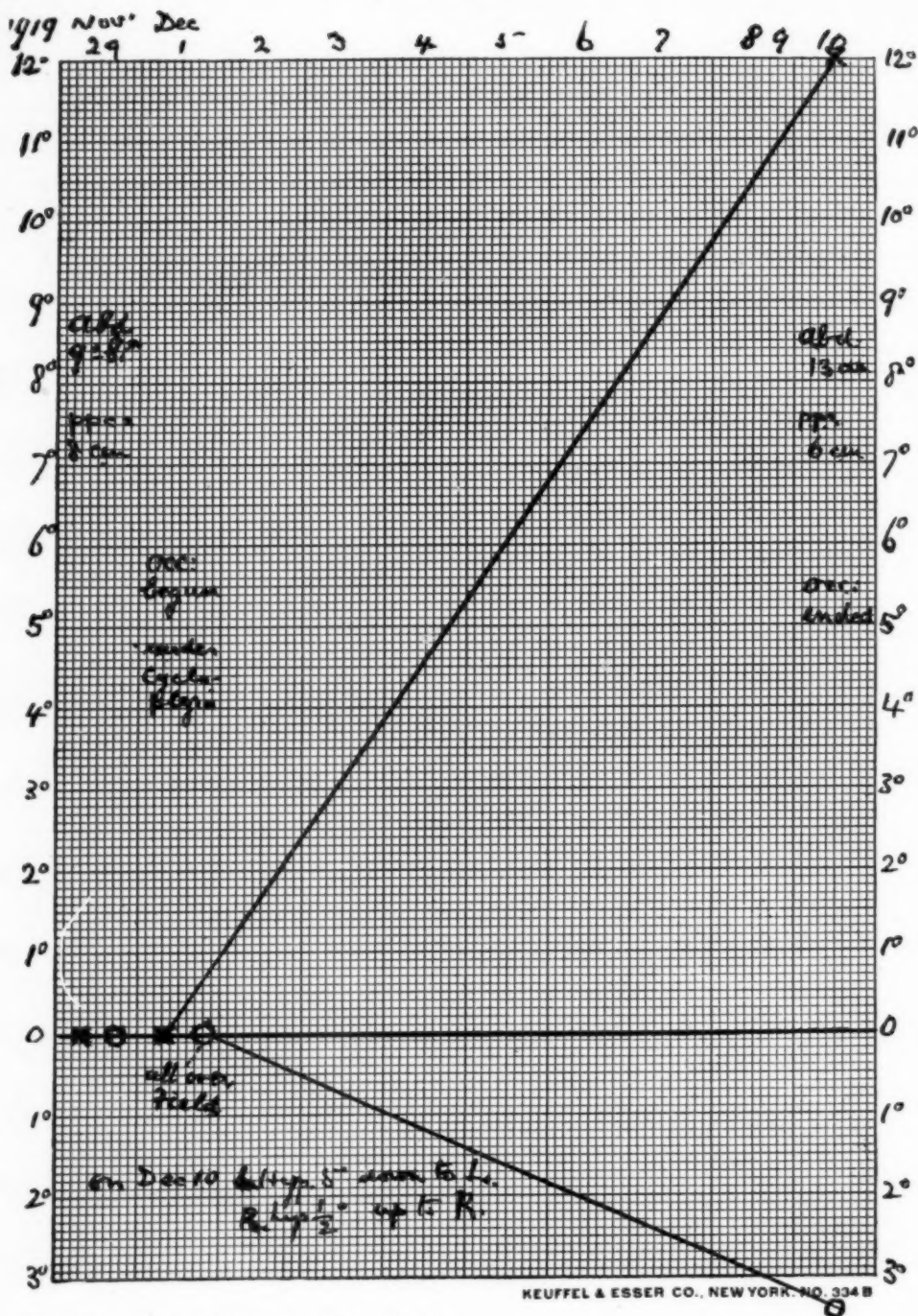


Fig. 6, Case 6. Miss B. I., 17½. (7986).

Always subject to headache. R. fronto-occipital. Now constant for three weeks. Asthenopia, photophobia, blurring.

Practically complete relief by partial prism correction.

Note primary abduction 9° —, 8° —, and final degree of exophoria 12°.

Refraction under scopolamin: Right + 0.75 sph. + 0.87 cyl. axis 90°; left + 0.50 sph. + 0.75 cyl. axis 85°.

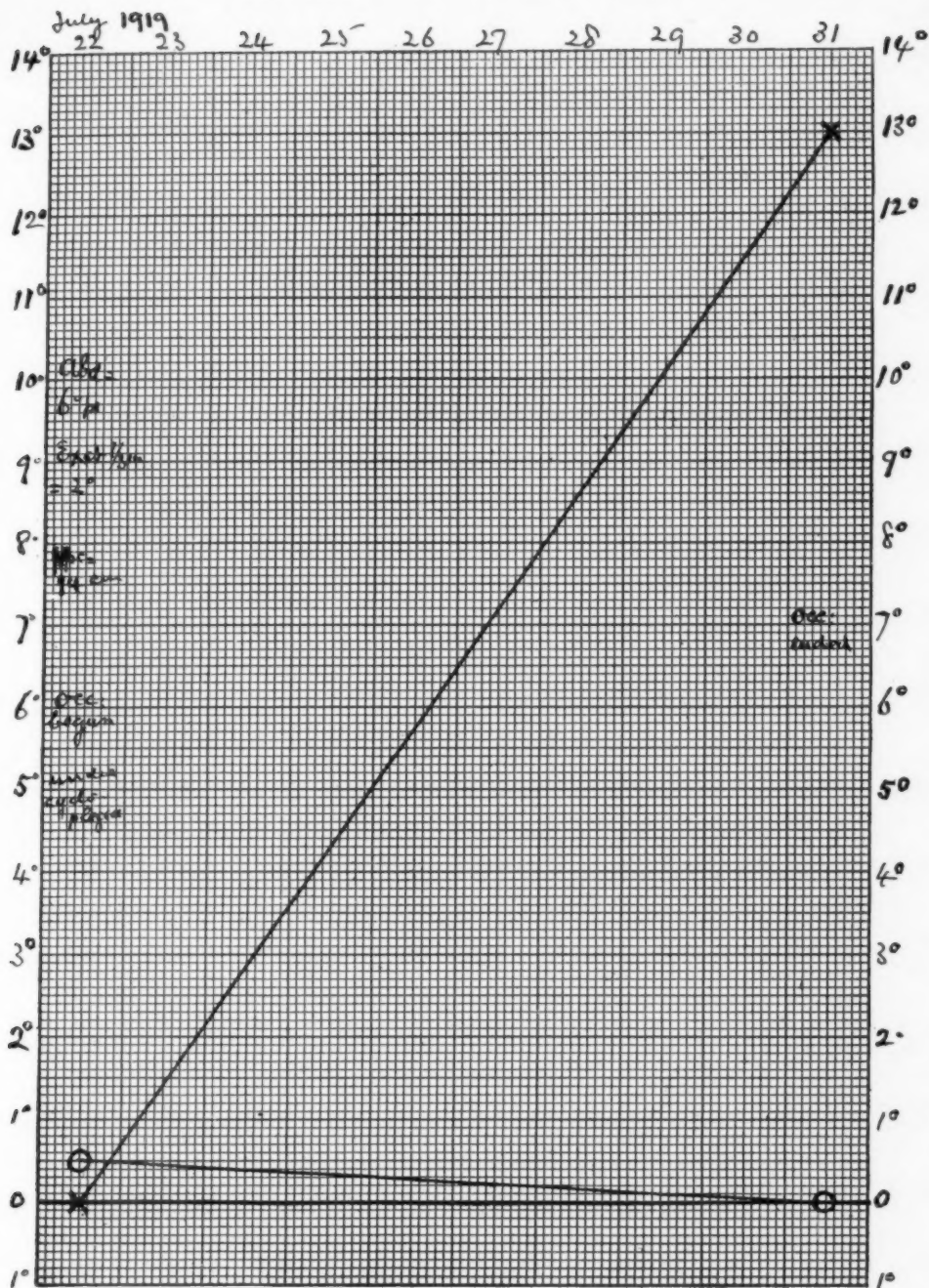


Fig. 7, Case 7. Mrs. C. R. S. (7663).  
Operated on for goiter seven months ago, for tonsils six weeks ago, on account of nervousness without much improvement in symptoms. Cannot do anything in the morning. Severe asthenopia, strained feeling, chiefly looking off. Photophobia, almost constant vertigo.  
Refraction under scopolamin: Right — 0.25 sph. + 0.62 cyl. axis 80°; left — 0.25 sph. + 0.62 cyl. axis 110°. Given full refractive correction and 3 base in each eye.  
September 26. Reports symptoms all gone. "Reads regardless"; no vertigo.  
Final Exophoria more than double primary abduction. Disappearance of Hyperphoria.

Operated on for goiter seven months ago, for tonsils six weeks ago, on account of nervousness without much improvement in symptoms. Cannot do anything in the morning. Severe asthenopia, strained feeling, chiefly looking off. Photophobia, almost constant vertigo.

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Final Exophoria more than double primary abduction. Disappearance of Hyperphoria.

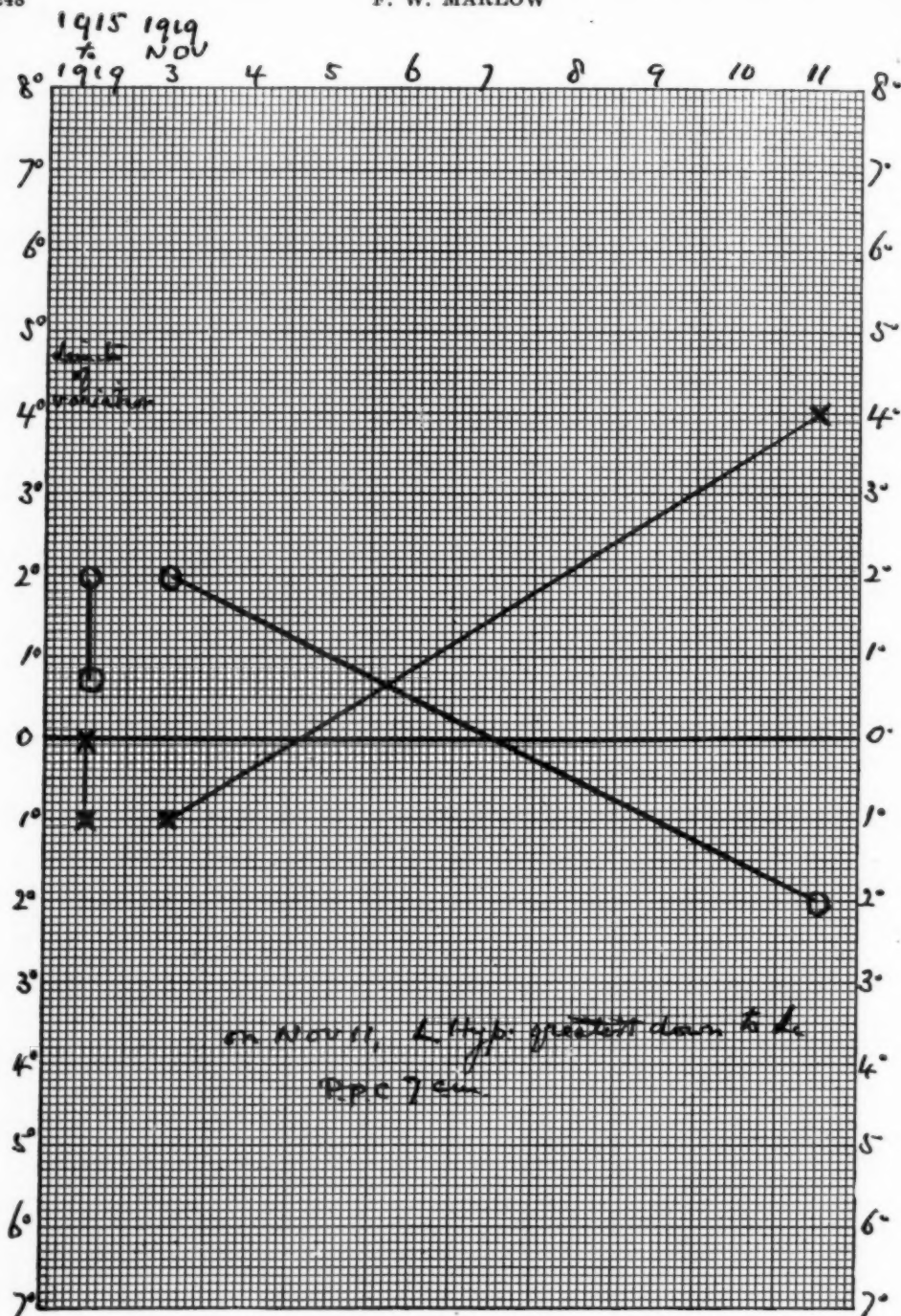


Fig. 8, Case 8. Miss D. S., 20. (4162).

September, 1915. Glasses cause lacrimation. Headaches, temporarily relieved by correction of refraction and R. Hyperphoria, but finally increasing in number. No headache while ground glass was worn (November, 1919).

March 9, 1920. "The glasses have almost entirely relieved my headaches." One or two a month now instead of several a week as before.

Refraction under scopolamin: Right  $+ 0.25$  sph.  $+ 0.12$  cyl. axis  $70^\circ$ ; left  $+ 0.25$  sph.  $+ 0.50$  cyl. axis  $90^\circ$ .

Note that for over four years muscle tests always showed from  $\frac{3}{4}^\circ$  to  $2^\circ$  of R. Hyperphoria, and from no lateral error to Esophoria  $1^\circ$ .



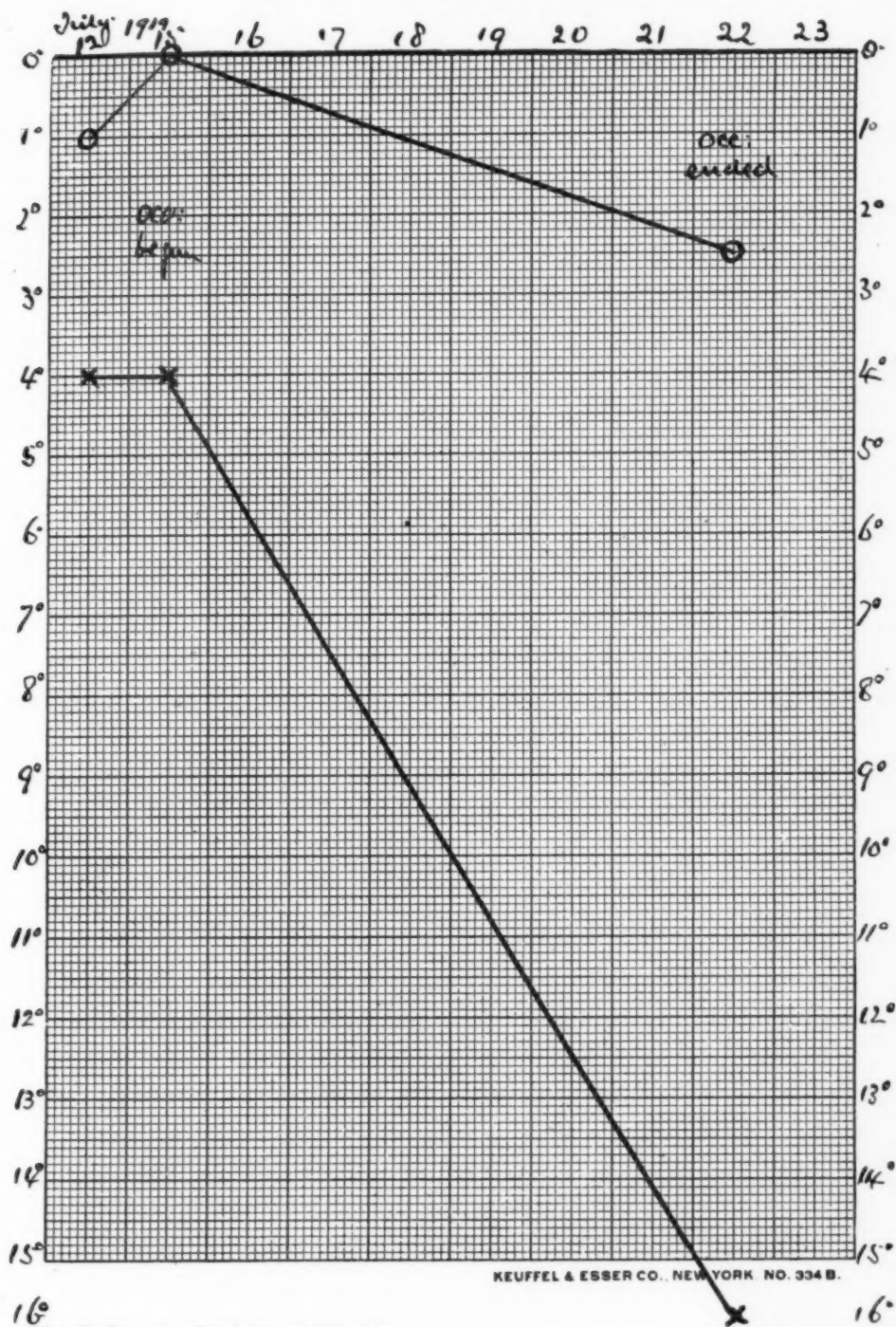


Fig. 9, Case 9. Prof. T. W. D., 35.  
 Use of eyes makes him nervous all over. Glasses (practically an accurate refraction) strain eyes. Photophobia. Would have to give up work if relief could not be obtained. A second occlusion test after partial tenotomy of each internus showed Esophoria 9° and L. Hyperphoria 1°. A second tenotomy of L. internus, L. Esophoria 4° and Hyperphoria 0°. Operations gave great relief.

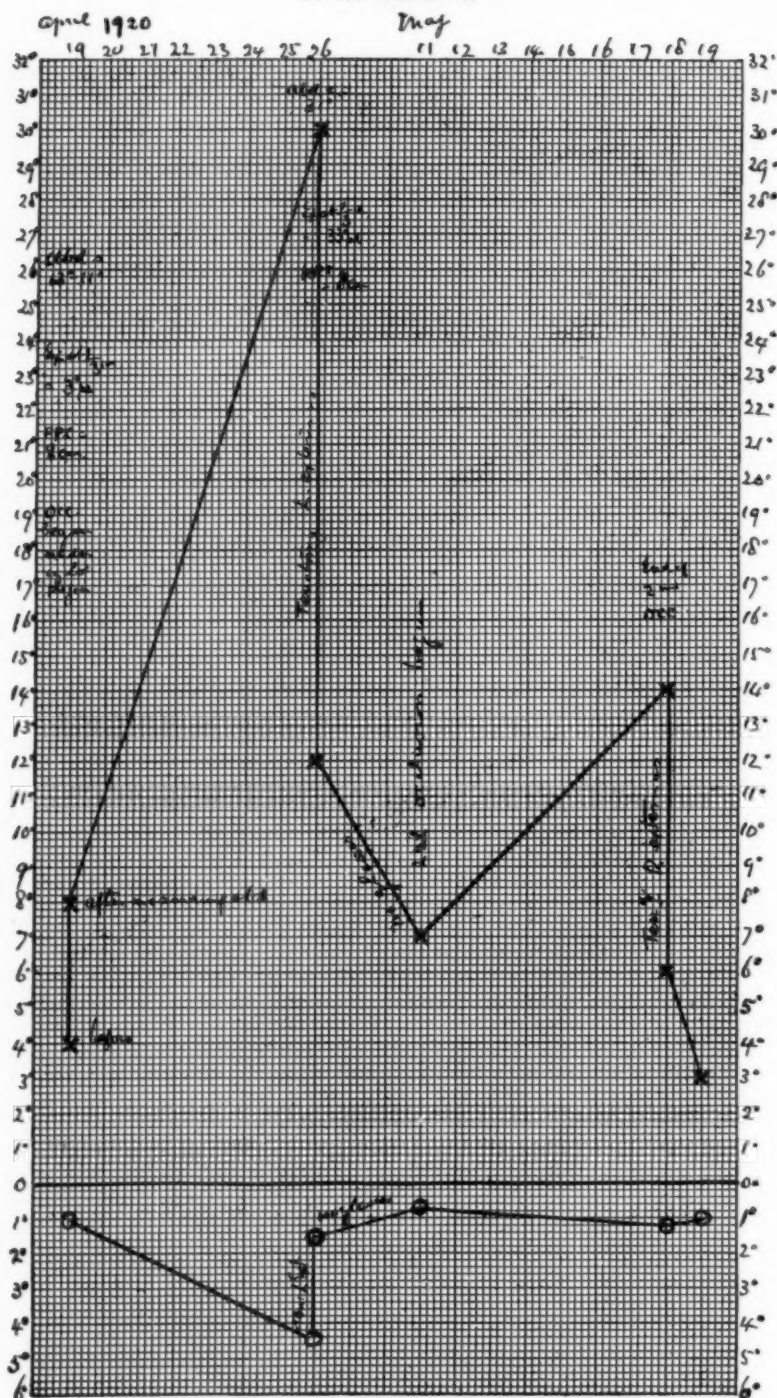


Fig. 10, Case 10. (8312).

Miss M. N., 22, obliged to give up teaching on account of "nerves." Headache, stomach trouble, insomnia and some asthenopia.

Refraction under scopolamin: Right  $+ 0.25$  sph.  $+ 0.25$  cyl. axis  $60^\circ$ ; left  $+ 0.12$  sph.  $+ 0.12$  cyl. axis  $135^\circ$ .

Note diminution of Hyperphoria after lateral tenotomies.

After first occlusion test L. Hyperphoria was  $7^\circ$ , down to L.  $0^\circ$  up to right.

On June 7th L. Hyperphoria  $\frac{1}{2}^\circ$  in primary position, and  $\frac{1}{2}^\circ$  — in all oblique positions.

Patient was greatly benefited by operations. Exophoria  $2^\circ$  at 6 m., and  $0^\circ$  at 13 m.

## CARCINOMA OF THE ORBIT WITH THE REPORT OF A CASE

WILLIAM C. FINNOFF, M. D., OPH. D.

DENVER, COLORADO

This paper discusses carcinoma of the orbit and reports a case apparently not connected with the normal epithelial structures of that region. A bibliography of such cases and one of recent cases of metastatic carcinoma of the choroid is appended. Candidate's Thesis submitted to the American Ophthalmological Society.

Many varieties of both benign and malignant tumors have been found in the orbit, and the occurrence of this condition is comparatively common. It is difficult, and usually impossible, to determine the variety of orbital tumor by clinical signs. Malignant neoplasms grow more rapidly than the benign, but the rate of growth is not a certain index of the variety of malignant tumor; and in the absence of signs of malignancy in the body, the only means of determining the nature of an orbital growth is by the microscopic examination of sections taken from it. If malignant neoplasms are present in other portions of the body, and a tumor of the orbit develops, the possibility of the orbital tumor being metastatic should be considered.

The occurrence of a carcinoma deep in the orbit, without involvement of the globe, the lacrimal gland or the skin, is very rare. The presence of metastatic carcinoma in the choroid is much more common than in the orbit. The reason is probably because of the greater choroidal vascularity.

Since Pearl's<sup>1</sup> first description of metastatic carcinoma of the choroid in 1872 many cases have been reported in the literature. Oatman,<sup>2</sup> in 1903, collected thirty positive and four doubtful cases from the literature. Grosvenor<sup>3</sup> gathered twenty additional cases which had been reported between the years 1903 and 1908, and Shumway<sup>4</sup> found four more in 1909; which totaled sixty-eight cases. Extension thru the globe into the orbit occurred in thirteen of the sixty-eight cases. With a few exceptions the orbital growths were small, and did not interfere with movements of the eyeball. Since Shumway's report in 1909, sixteen additional cases, which brings the total to eighty-four, have been reported.

(See bibliography). There was a record of extension thru the globe in Oatman's and in one of Ishihara's cases. In both of these cases the orbital growth was small and adherent to the eyeball.

The primary carcinomata from which the choroid was secondarily attacked were located in the great majority of instances in the breast, but the lung, stomach, suprarenal body, and uterus were also primary seats.

Only seventeen cases of carcinoma of the orbit, without involvement of the globe, lacrimal gland or skin of the face have been reported in the literature. In several of the reported cases of metastatic carcinoma of the orbit, the first symptom was a paralysis of one or more ocular muscles. Horner's<sup>5</sup> case was in a man aged 65 years, who developed ptosis which was followed four months later by paralysis of all of the recti muscles. No nodules were felt in the orbit, but a growth was noted on the thyroid and submaxillary region. The man died six months after he was first seen. The post mortem revealed a carcinoma of the dura over the base of the sphenoid bone; extending from the optic nerve at its entrance into the foramen backward and downward to the base of the brain. In the orbit nodules were found in the recti and levator palpebrae muscles. The thyroid gland, sternocleidomastoid muscle, abdominal viscera, right pleura costalis, pericardium, peritoneum, and suprarenals were invaded by the carcinoma. Horner believed that the paralysis of the ocular muscles was due to pressure on the nerve rather than to involvement of the muscles by the carcinoma.

Elschnig's<sup>6</sup> case was a woman of 73 years, who had a carcinoma of the cervix with metastasis in the mamma. All

of the eye muscles excepting the inferior oblique were invaded by the growth.

A woman 58 years of age was seen by Wintersteiner<sup>7</sup>. She had a carcinoma of the left breast and the neighboring lymph glands were involved. The first eye symptom to develop was a paralysis of the right internal rectus muscle. The patient died and post mortem examination revealed metastases in the liver, retroperitoneal glands and all of the ocular muscles of the right eye, excepting the inferior oblique.

In Axenfeld's<sup>8</sup> case the woman developed a paralysis of the ocular muscles of the left eye, which was thought to be of toxic origin. Later exophthalmos developed and the tumor was found to be a metastasis from a carcinomatous mammary gland which had been removed two years previous to the eye symptoms.

Kipp<sup>9</sup> saw a woman aged 58 years who developed ptosis of the left eye, which was followed by great impairment of motion of the eye in all directions. Seven months later a slight exophthalmos was noted. The breast had been removed for cancer. The patient died but an autopsy was not obtained. Kipp believed that from the symptoms a diagnosis of carcinoma was correct.

Shumway<sup>4</sup> saw a woman aged 49 years. Her vision had been failing in the right eye for five months. When first seen there was limitation of motion of the right eye in all directions. A corneal ulcer developed and the anterior chamber filled with yellowish white exudate. The eye was enucleated and the vitreous was found to be clear, and no evidences of metastatic carcinoma were found in the choroid. Later a scirrhous carcinoma was removed from the orbit. The breast and axillary lymph glands were the seat of a carcinomatous tumor. The patient died of intestinal obstruction; and the spleen, liver, kidneys, uterus, ovaries, broad ligament, the two abdominal recti muscles, and the pelvic wall were found to be invaded by the carcinoma.

In Birch-Hirschfeld's<sup>10</sup> case, a carcinoma of the orbit was found in a woman 35 years of age. Recurrence followed exenteration of the orbit and the use of radium. The tumor originated in the hypophysis and extended into the orbit, and several small nodules were found in the choroidal vessels.

Reese<sup>11</sup> removed a tumor from the orbit, which proved to be a carcinoma when sections of the growth were examined under the microscope. The patient refused farther treatment and disappeared. The presence or absence of a demonstrable primary focus is not mentioned.

Combaud,<sup>12</sup> in a review of his cases of malignant tumors of the orbit, found that he had seen five cases of metastatic carcinoma in this location. Most of them were secondary to carcinoma of the breast.

Knapp's<sup>13</sup> case had all the symptoms of a tumor in the posterior portion of the orbit. The patient was a woman 31 years of age. After operation the tumor was found to be a carcinoma. The tumor mass extended to the apex of the orbit and invaded the ethmoid cells. Ten and one-half months after the operation the patient died from extension of the tumor to the brain. No mention was made of carcinoma involving other organs of the body. The author believed that it had originated from a mass of tissue which probably had been separated from the lacrimal gland during its development.

Genet's<sup>14</sup> case had exophthalmos for nineteen months. The carcinoma of the orbit was secondary to a carcinoma of the breast.

Ramsay<sup>15</sup> removed a carcinoma from the orbit of a man aged 75. There was recurrence in three or four months. Death occurred ten months after the operation. There was no mention of a primary growth.

In Dombroski's<sup>16</sup> case the orbital tumor was apparently an extension from a primary carcinoma of the sphenoid sinus.

There have been a number of cases of carcinoma and epithelioma of the orbit reported in the literature, which



were direct extensions from well defined primary malignant growths in the lacrimal glands, the lids or the skin, and presented no difficulty in diagnosis. It is the obscure orbital tumors, with no direct connection with demonstrable neoplasms that are here considered.

The occurrence of a new growth in the orbit, in the absence of a history of malignant neoplasms elsewhere in the body, leads one to believe that he is dealing with a primary tumor in this location. If the tumor is thought to be deeply situated in the orbit the possibility of its being a carcinoma is likely to be overlooked because it is rarely found in this location, and the real diagnosis is not made until sections of the new growth are examined under the microscope.

September 17th, 1918, I was consulted by C. O. H., aged 44 years, because of loss of vision and proptosis of the right eye. About a year before he had an abscess of the upper right incisor tooth, which was followed by pain over the right maxillary antrum. The tooth was removed, which resulted in partial relief of the pain. In April, 1917, a double herniotomy and appendectomy were done. If tumors were found in the abdomen the patient had not been so informed by the surgeon.

In March, 1918, a troublesome diplopia developed which lasted about four months, and only disappeared after the vision in the right eye had become so poor that he could not distinguish objects with it. In May, 1918, he had been refracted and was given:

R. + 0.75 D. Cyl. Ax. 90°.

L. + 0.50 D. Sph.  $\ominus$  + 0.75 D. Cyl. Ax. 90°, with a +0.50 D. Sph. added for close work. The symptoms were not relieved by the wearing of glasses and the vision continued to fail.

For three months previous to the first examination (Sept. 17, 1918) the vision of the right eye had been failing and the eye had been growing more prominent than the left. He had been refracted early in September and was wearing:

R. +1.00 D. Sph.  $\ominus$  a 3° prism, base up.

L. +1.00 Sph.  $\ominus$  a 3° prism, base down.

When first seen the vision of the right eye was nil, the pupil was dilated (5 mm.) and did not react to light but reacted consensually. The right eye protruded forward 6 mm. farther than the left. The displacement was straight forward and the motility of the eye was limited in all directions. He had difficulty in closing the lids of the right eye, but no ulcer of the cornea had developed from exposure. In trying to push the eye into the orbit a definite resistance was met with. Palpation around the globe failed to reveal an abnormality. The preauricular, submaxillary and cervical lymph glands were not enlarged.

On ophthalmoscopic examination, the media of the right eye were found to be clear. The disc was swollen, 1 D., red and slightly vascular, the veins distended and tortuous and arteries slightly contracted. No hemorrhages or exudates were present.

The left eye, vision, with +0.50 D. Sph.  $\ominus$  +0.75 D. Cyl. Ax. 90°=20/20; movements normal and ophthalmoscopic examination negative.

A diagnosis of tumor of the orbit, probably of the optic nerve, was made. The Wassermann reaction of the blood was negative. Urine and blood counts were also negative. X-ray plates of the head failed to show unusual density in the orbital region or in the nasal sinuses. The sella turcica was of normal dimensions. Nasal examination including puncture and washing of the right maxillary antrum was negative. Thinking that the condition might be syphilitic even tho the Wassermann had been negative, mercury and iodides were pushed for three weeks with no improvement.

Consultation was advised before proceeding to operation. Mr. A. C. Hudson, of London, England, was seen and gave the following report: "The signs appear to me to favor a diagnosis of endothelioma of the optic nerve, which might be dealt with by operation from the outer side of the orbit by La-

grange's method. I should, however, be inclined to make a preliminary exploration from the upper inner corner of the orbit with view of possibility of an inflammatory focus in connection with the posterior ethmoidal cells."

On October 18, 1918, the patient was anesthetized with ether and an incision

As there was no possibility of saving the ciliary nerves and vessels or the eye muscles, the globe was enucleated and fixed in Zenker's solution. The main neoplasm was firmly fixed in the orbit and adherent to the periosteum, and completely filled the apex. It was not attached to the globe or to the lac-

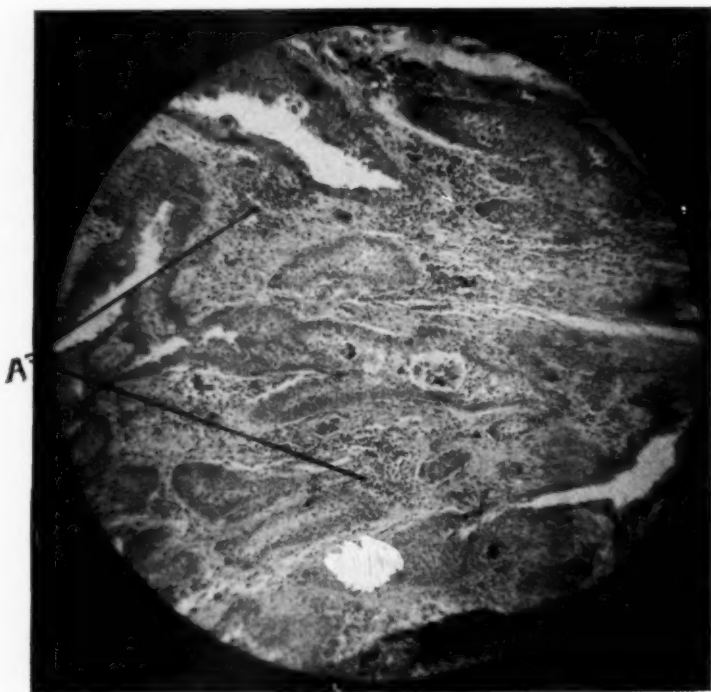


Fig. 1.—Section of tumor showing masses of epithelium surrounded by fibrous tissue. A areas of chronic inflammation.

was made parallel to the line of the orbit above and on the inner side. With a probe the inner wall of the orbit was explored and was found to be smooth. The exploration wound was then closed and the orbit entered after the method of Lagrange. The optic nerve was readily found and palpated with the little finger but no enlargement was discovered. The orbit seemed shallow and filled with a firm smooth mass which included the optic nerve and eye muscles. The mass was so firmly fixed in the orbit that it could not be shelled out with the finger, and it was evident that the apex of the orbit was involved by the tumor.

rimal gland which apparently was normal. It was only with the greatest difficulty that the tumor masses were finally pried loose with a periosteotome. A marked reaction followed the operation but in ten days the wound healed.

Five hard encapsulated tumors were removed. The largest measured 19x15.5x9.5 mm., the second 11x9x8 mm. The smaller tumors were about the size of a split pea. They were fixed immediately in Zenker's solution. The following day the tumors were cut and macroscopically they resembled encapsulated fibromas.



The tumors were imbedded in paraffin and a few thick sections were made from the blocks with an improvised microtome, using a razor for the blade. These were stained with hematoxylin and eosin and examined under the microscope. The thick sections resembled an endothelioma. The patient

filled with a granular debris. The lumen is surrounded by several layers of epithelial cells. (Fig. 2). These cells are embryonal in character and mitosis is present in a few of them. In some areas the epithelial cells rest on a definite basement membrane, while in others the epithelial mass has

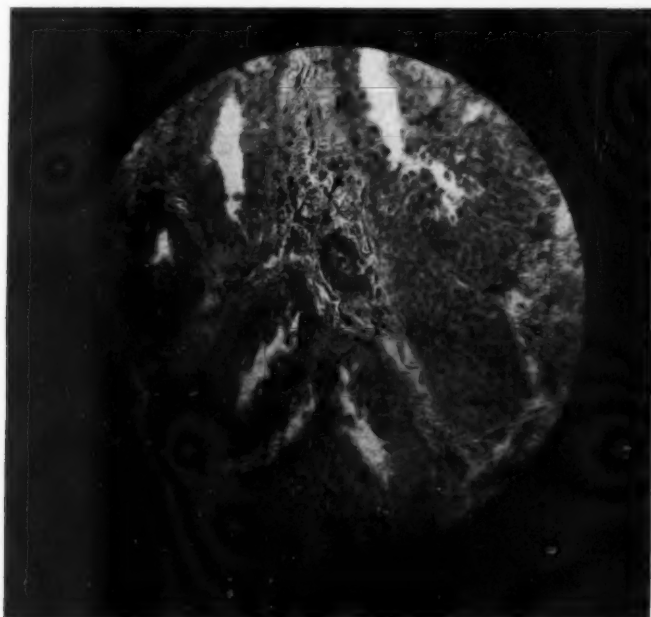


Fig. 2.—High power. Showing a typical gland-like arrangement of epithelial masses.

was instructed to return to America and to immediately consult his surgeon here for farther observation and treatment. His brother was informed of the nature of the growth and told of the possibility of its recurrence.

Later, when better laboratory facilities were at hand the tumor and the eye were sectioned, stained with hematoxylin and eosin and carefully examined.

The tumors were surrounded by a fairly dense mass of connective tissue with trabeculae which go in all directions and surround the muscles, nerves and vessels. There are masses of epithelium scattered irregularly thru the tumor. (Fig. 1). These masses have an atypical gland-like arrangement. A few have a lumen which is usually

broken thru and sends out finger-like projections into the surrounding tissue. In some areas masses of epithelium are found surrounding the coverings of the optic nerve and the eye muscles, but no direct invasion of these structures can be found. No cartilage is found in any of the tumors.

There are several areas of localized chronic inflammation scattered thru-out the tumors. (Fig. 1-A).

The large amount of dense connective tissue with the atypical glandular arrangement of the epithelial cells; and an absence of basement membrane in several locations, with invasion into the surrounding tissues and the embryonic character of the epithelial cells establishes a diagnosis of scirrhus adenocarcinoma.

No metastatic areas were found in the choroid. The optic nerve was swollen by edema and infiltration with a few small round cells which indicated a low grade of chronic neuritis. (Fig. 3).

The author has been fortunate in obtaining the following subsequent history of the patient from his relatives. With the exception of slight discom-

interference with the motility of the eye.

The patient continued to lose strength and died September 8, 1919. An autopsy was not done, and the microscopic nature of the tumors in the chest was not determined.

From the history and clinical findings in this case one might conclude that the primary tumor was in the



Fig. 3.—Cross section of optic nerve showing swelling, with slight lateral displacement of retina.

fort in the face and head, the patient was comfortable until February, 1919, when he began to suffer with pain in the neck, chest and back, which was diagnosed neuritis by his family physician. He was sent to a sanatorium where the diagnosis of neuritis was confirmed. However, he continued to grow worse and in the latter part of June, 1919, he went to the Mayo Clinic, where, after X-ray examination, the diagnosis of multiple tumors in the lungs and probable tumors in the spine and abdomen was made. There was no recurrence in the orbit. Surgical interference was not advised, and the patient returned to his home. In the latter part of July a semiparalysis of the left side occurred and the sight of the left eye began to fail rapidly. There was no pain in the eye or orbit and there were no signs of proptosis or

orbit and that the tumors in the chest and other portions of the body were metastatic. Such a conclusion, however, would be purely hypothetical, and probably incorrect, because of the rarity with which such carcinoma occurs in the orbit.

If the tumor was primary in the orbit, it would be explained by the theory, that, during the development of the lacrimal gland a portion of the ectodermal and mesodermal bud, which is the foundation of the gland, became separated from the true bud and remained as an embryonic nest in the orbit, until such a time that conditions were favorable for its growth. The cells in the nest having embryonic characteristics would undergo rapid development and become a malignant tumor. Wharton and others explain

the occurrence of mixed tumors of the lacrimal and salivary glands by this theory.

The author is inclined to believe that the primary carcinoma existed elsewhere in the body, either in the chest

or abdomen, and that the orbital tumors were metastatic.

The loss of vision of the left eye may have been due to pressure on the optic nerve by intracranial extension from the tumor in the right orbit.

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## FOCAL ADJUSTMENT IN THE APHAKIAL EYE

F. PARK LEWIS, M. D., F.A.C.S.

BUFFALO, N. Y.

A case is here reported in which an aphakial eye obtained good distant and near vision with the same lens and without the conditions that are usually accepted as making it possible. Other cases of the kind in the literature are referred to and the possible mechanism discussed. It is suggested that a limited portion of the vitreous humor may exert the influence of a convex lens which may be varied by muscular action. This is a paper read before the American Academy of Ophthalmology and Oto-Laryngology, October, 1920, to which is appended the report of a second case of the same kind since observed.

The first requisite for the acceptance of any theory is that all of the observed phenomena shall be completely in accord with the principles which have been affirmed. If any instance arises out of harmony with the theory enunciated and more especially if such instances are repeatedly noted, either the accuracy of the observations or the validity of the theory is then open to question. In adding one more to the already long list of cases in which a wide range of focal adaptation was found present in the absence of the mechanism to which that function is universally ascribed, the entire theory is challenged. If insistence is made, as it was by Donders, that "not a trace of accommodative power remains in the eye from which the crystalline lens has been removed, even in the young subject," then some other adequate explanation must be given for those cases in which a wide range of focal adaptation is found present. It is a curious non sequitur that Donders should specifically refer to the *young* subject, since according to the theory of Helmholtz which he accepted, that the power of accommodation is due to the inherent elasticity of the crystalline lens, in the absence of this lens it could make no difference whether the subject was young or old.

The purpose of this paper is not only to report a refractive anomaly which seems to controvert a generally accepted law in ocular physics, but as well to draw from it and others the deductions which would necessarily follow, and which lead to the conclusion that another element than that of the crystalline plays an important role in the normal process of accommodation.

On March 17th, 1920, I was consulted by W. H. M., who was suffering from a slight conjunctivitis following a severe fall from one floor of the shop in which he was employed to the other, which knocked out his front teeth and smashed his glasses. Altho he could manage fairly well without them, they naturally improved his vision and he was anxious to have them replaced. He is 51 years old, of light complexion, heavy eyebrows on the nasal side of each eye, scant on the temporal sides, a strong vigorous man whose musculature is well developed and whose average weight is 175 pounds. He has blue eyes with round pupils of about the size of those usual in light eyed people which is a little smaller than is found in those who are dark. He had been operated on both eyes for congenital cataract when a child by Alfred Graefe of Halle, first in 1872 and again in both eyes for secondary operations on the capsules in 1878.

It is rather interesting in this connection to recall that it was Albrecht von Graefe, the cousin of Alfred (who operated on the case which I have to report) who suggested to Donders that accommodation *did* remain in the eye after the removal of the cataractous lens, and this led to the much discussed point of light experiment by the latter observer.

An examination revealed the following facts:

Without glasses, right vision equals 5/200ths; left vision equals 5/200ths.

Refraction: R. + 10 D. Sph.  $\ominus$  + 1. D. Cyl axis 105° equals 20/20ths less 2. L. + 9.50 D. Sph.  $\ominus$  + 1.25 D. Cyl axis 60° = 20/20ths less 4.

Under dilation the pupil of the right eye is found to be slightly irregular because of adhesions on the inner and

lower side leaving a small band of capsular tissue connected with the pupillary margin. Left pupil is round, the area clear as can be determined with the undilated pupil, the conjunctiva free from injection, irides tremulous thruout their entire extent. Ready contraction of the pupil to light, slight but marked contraction of the pupil in effort to accommodate. With O. U. + 2 D. added to his distance glasses he reads more comfortably and easily and prefers the added correction for close work. With the ophthalmometer, the eye being at rest and the mires focused on either cornea when an effort is made to look at a point within the opening of the tube, without a change of direction of the axis of vision, there is a definite blurring of the image and the instrument must be advanced to what would be equivalent to about half of one diopter to make it clear again. In testing the eyes with a small point of light, the form of the light appears to be unchanged in the right eye by any focal effort. In the left eye it becomes slightly elongated.

With the distance correction unchanged in position before his eyes, he reads J. 1 at 7 inches with both eyes; with the left eye closed, he reads J. 1 at 9 inches and *after a few minutes effort*, can carry the print as far as eighteen inches and continue reading. As soon as the left eye is opened and he attempts binocular single vision he is able to bring the type back again to 7 inches. In using the right eye, without any glasses whatever, at short range he closes the lids to a slit scarcely more than 2 millimeters wide, holding the reading matter to the left side of the nose so that he is looking diagonally over the nose and slightly downward over the printed page. With the right eye closed he at first reads with difficulty very large letters, *but the acuity gradually increases* until he is able to read 1.25 D. (about J. 4) at three inches. *The letters blur as he attempts to read but they become definitely clearer when he makes a conscious effort without change of position of the type.* The pupil does not change in size as the type becomes distinct. The ophthalmometer shows there is a slight change in the cor-

neal curvature. How much, it is very difficult to say.

Now if a man 51 years old and having normal eyes were able with suitable distance correction only to read type of the fineness of J. 1 with an amplitude of accommodation extending from 18 inches to 7 inches, we would say that he had extraordinary ciliary power. In the absence of the crystalline lens we naturally ask ourselves, thru what means such a feat could be accomplished. If this were a unique occurrence it would be of great interest but Davis has shown in a paper read before the American Ophthalmological Society last year, that this is not only not unique but this same phenomenon has occurred in many instances even in a more marked degree and under the observation of men of such undoubted ability and veracity that the facts can no longer be questioned.

The title of Davis' paper, "Accommodation in the Lensless Eye," demands a moment's attention. It negates itself. If accommodation is the sole property of the crystalline lens then obviously in the absence of that lens there is no such function, and the affirmation of the presence of focal adaptation is an admission that it must be the result of the action of some other mechanism.

Neither can there be such a thing as a "lensless" human eye. The eye is itself a lens. The common habit of referring to the crystalline as the *lens* of the eye is a looseness of expression that ought not to continue. The eye is a teleomicroscope. Moreover, the most important lens is not the crystalline because the eye can exist and function satisfactorily without it. The essential lens is the *vitreous* which with the cornea and the aqueous constitute a lens of about eight times the strength of the crystalline.

This is not the hypercriticism of a purist in language, important as it always is to use exact terms of expression, but it is urged because the term commonly applied to the vitreous *body* leads the mind away from the essential fact, that it is not a simple homogeneous mass supporting the retina, thru which the rays acted upon by the crystalline are focused, but that it is itself an active agent in the accommodative process and



an essential part in the combined lenticular system.

In his valuable paper of last year, Davis supplements another on the same subject read in 1895 in which he reported two former cases having like focal powers in the absence of the crystalline lens and summarized the literature up to that date. In his more recent paper he very completely reviews the entire subject, and in the report of his case as well as in the discussion that followed, the existence of the phenomenon, altho infrequent, was verified beyond question. In some of the cases, particularly in that of Loring, the focal control was amazing. This discussion of the subject was so complete and recent that it is easily within the memory and reach of those who are interested, so it will not be necessary even to summarize it. To substantiate the case which I am reporting the patient was seen by several very competent ophthalmologists including Starr, Blaauw, Glosser, and others who assisted in determining that the facts were as reported. He was taken before the Buffalo Ophthalmological Club and a further demonstration was made, so that there were at least 20 competent observers who assured themselves that the facts were as given. The facts must now be accepted as fully authenticated. It only remains to determine whether any explanation can be given that will be in harmony with our accepted ideas as to the manner in which this faculty is effected. In the discussion before either the Buffalo Ophthalmological Club or the American Ophthalmological Society, no absolutely definite conclusion was reached. A number of opinions were offered and four reasons were given which were considered in some measure to explain how this anomalous action was produced.

First, the smallness of the pupil; in practically all of the cases either a relatively small pupil or a slit in the capsule was found present.

Second, it was considered that it might be dependent upon the larger size of the retinal images due to the absence of the lens.

Third, that it was an acquired power

of interpreting the circles of dispersion and,

Fourth, that by the tilting of a strong plus glass the monochromatic aberration was neutralized and the ability to interpret the images increased.

But none of these explanations would seem to be valid. It can be readily demonstrated that a small pupil is not sufficient in itself to produce the results which have been shown to be present. If this were the cause of the increased focal range it would have great practical importance. It would justify Tscherning's conclusion that a refractive examination with a pupil widely dilated is less accurate than one with a small pupil. It would suggest the advantage of placing a perforated diaphragm with a small opening before the trial lens when a refractive test is being made. It would be a forceful argument for the more common employment of the simple extraction of cataract as the preservation of the iris intact would not only have an esthetic value but would be of increased visual importance as well.

There can be no question that by cutting off the marginal rays, the clearness of vision is in some measure increased, altho it would have no influence, whatever, on the range of accommodation. I may say I have greatly improved the comfort of cataract patients by placing a correcting lens in the center of an aluminum disc having a diameter of 4 millimeters instead of using the large lens commonly employed. One patient whose eyes grew readily tired with the old correction was enabled to read for hours by means of this device, but a small pupil is not a pinhole pupil and that this range of focal adaptation which is occasionally observed cannot be dependent upon a pupil  $1\frac{1}{2}$  to 2 millimeters in diameter can be readily demonstrated. It would be necessary only to place a diaphragm perforated with an opening of that size before the correction lens of any patient who had been operated for cataract and an increased range of focal adaptation would be immediately secured. We know that this cannot be done. We can also eliminate as an ex-

planation any special ability to read fine print either by training or by cutting off the dispersion circles, because one cannot interpret fine print, other than by distinctly seeing it. There might be some basis for the suggestion that by training the visual sense from childhood the aphakial eye might be made to see smaller images than would be possible when the lens had been removed from the eye of an adult, but the question naturally arises, of *what* muscles and *how* could such an effect be produced. All of these explanations would apply equally to every case of cataract that had been operated on successfully, in which the same conditions either were normally present or artificially produced. Cases like these under consideration occur with such infrequency that they have been reported as unusual and extraordinary. Some other element must enter into the condition than that which has so far been noted. In physics there must be a physical explanation of physical phenomena.

Nature is not prodigal in duplicating her methods. If in any of the lower animals and birds a simple measure accomplishes the desired object, the same general plan with perhaps more complicated apparatus is used to achieve a like end in the higher forms of life.

In the eye of the ox it is found that by carefully cutting off the cornea and removing the iris and then with a probe breaking away the adhesions of the ciliary, the entire intraocular structures including the choroid come out en masse. The adhesions between the capsular ligaments, the patellar fossa and the vitreous are firm ones. After then carefully removing the choroid, the iris and the retina, it will be seen that the entire lenticular system is joined together. The fibres of the suspensory ligaments are not lying loosely on the hyaloid membrane but are incorporated in it and extend far back into its substance and it is only by breaking them at the lenticular ring that the lens can be loosened. The attachments then are at the chorio-scleral junction at the margin of the

lens and to the hyaloid membrane. The tractive power necessary to change the curvature of the lens, if it were required, would be very great, whereas, the power to pull the vitreous forward would be slight as the crystalline practically floats on the surface of the vitreous. Moreover, another important factor is brought to light in studying the structure of the vitreous. If the posterior portion of the eye of the ox is removed it will be seen that the vitreous appears to be absolutely homogeneous. This is far from being the case. This can be determined by palpation. By applying the finger tip over the vitreous we find that it consists of two parts, an outer portion in which the density is very slight, and which is of a thin gelatinous consistency, and an inner portion which is relatively firm, elastic in feel and in which the difference between the central firmer portion and the outer thinner portion is readily detected by palpation; the outer portion of the vitreous body occupies a space of about from 2 to 2½ millimeters, completely surrounding the firmer central portion. When this is extruded thru an opening in the eyeball we find that it takes on a definite lenticular form. If the entire mass is taken from the eyeball, in a short time the more watery structure runs away, leaving the denser portion behind. There exists at least in the eye of the ox within the vitreous body, a vitreous lens, which together in its adjustment with the crystalline makes a compound lenticular system, thru which all of the functions of vision may be performed with the least amount of effort. (See Fig. 1.)

In the eye of the rabbit the lens is almost spherical and the amount of vitreous outside of it is very small. There would seem to be nothing gained in that case by a change of curvature. Wood and Slonaker have shown in certain birds, notably the sparrow, the anterior posterior length of the whole eyeball, including the cornea, lens and vitreous, is increased during accommodation. In the amphibians the eye is adapted for infinity

and is accommodated for near vision without change of curvature of the lens. The lens is pushed forward by the compression of the vitreous body. Wood in his exceptionally fine article on *Comparative Ophthalmology* says "that the action of the lens which is true of birds and of some mammals is not applicable to man," and he puts in the qualifying phrase, "if the Hemholtz theory be accepted."

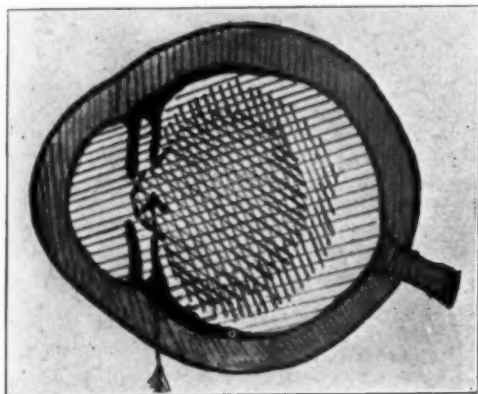


Fig. 1.—Vitreous protrusion or lenticonus, indicated by arrow, produced by pressure in the absence of lens. The ciliary muscle fibres are attached to the suprachoroida, exerting traction on the vitreous lens. In absence of the crystalline lens in the exception cases, the combination of the extrinsic and intrinsic muscles push forward the vitreous lens, and give it the form of a lenticonus, thereby developing a range of focal adaptation.

In the human eye there would seem to be very much the same density in the center of the vitreous as is found in the eye of the ox, but as the number of perfect human eyes which can be obtained for dissection is so limited this fact cannot be at present determined. Now if the mechanism in the human eye resembles that of the ox, an explanation can then very readily be made of the presence of focal adaptation in the absence of the crystalline lens. There would be left the lens of the vitreous which coming up to the pupil would be pressed upon by the ciliary muscle, the retraction of its margins against the vitreous body would force the anterior surface forward, giving it an increased curvature.

A very similar process, as Hess has shown, occurs in the eyes of reptiles

and birds whose extremely plastic lens is forced into a conical projection bulging thru the pupil, thereby increasing its refractive power. This might easily occur in the plastic vitreous after the removal of the crystalline lens, as the external muscles in conjunction with the ciliary attachment to the suprachorioidea are strong

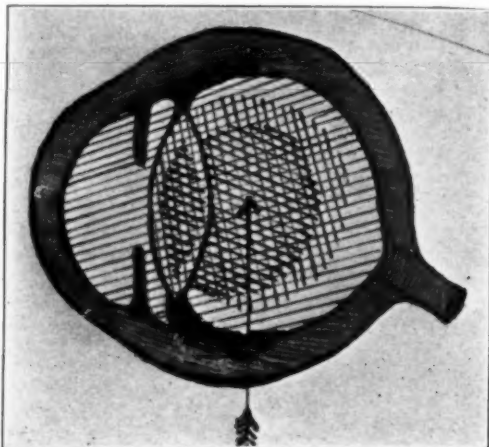


Fig. 2.—Possible vitreous lens, portion of greatest density indicated by arrow. In the presence of the crystalline lens the traction on the suprachorioidea relaxes the ciliary bodies, which fill with blood as erectile tissues. The same effort forces forward the vitreous lens, which presses against the posterior part of the crystalline lens, its denser portion pushing forward the more plastic part, in a lenticonus of the curve necessary to meet the focal requirements. Its relaxation allows the blood from the ciliary bodies to flow into Schlemm's canal, the vitreous lens slips back, and the crystalline resumes its normal curve for the eye at rest.

enough to give the necessary pressure. There is reason to believe in these unusual cases that that is precisely what occurs. In the case which I have reported the musculature of the man was exceedingly strong. He had in all probability trained his eye muscles so that there was marked pressure on the sclera in the act of convergence. There could even be direct pressure on the vitreous thru the action of the ciliary, from the same impulse that caused convergence. I refer briefly to the experiments made by Hensen and Voelckers so often reported but never seemingly reproduced, which have demonstrated the segmental action of the ciliary muscle because when any

single ciliary nerve fiber was irritated, "contraction of the iris and the ciliary muscles and the advancement of the choroid takes place only in one isolated portion, thereby making possible astigmatic correction."

Savage approves the theory of segmental action of the ciliary when he says, "It may also happen that a corneal astigmatism may be in part or wholly offset by a lenticular condition of tilting of the lens such as that discussed thru the agency of the action of the individual fibres of Bowman's muscle."

In a paper read before this Academy in 1905 entitled "The Ciliary Process in Accommodation," I said, "The long fibres of the ciliary muscle are attached anteriorly in the sclero-corneal tissue constituting the boundary wall of Schlemm's canal. They are attached posteriorly to the choroid. The fibres of Müller form the angular ring beneath those of Bowman."

The physiologic action which follows would almost seem obvious. A contraction of the long fibres relaxes the zonule. Coincidentally with this, the circular fibres surrounding the margin of the iris contract, impeding the free venous flow and causing the ciliary processes to become turgid, with blood; they in turn pressing, by their bulk, on the anterior part of the suspensory ligament of necessity flatten the edges and protrude the center of the lens in exactly the form that catoptric tests have shown to be present.

Accommodation having been completed, the muscles relax allowing the vessels which had been full, to empty, in all probability in doing so allowing the overflow to pass into Schlemm's canal.

It will be evident from this that as the artery leads by way of a very large capillary into the anastomosing mass of veins the passage of blood into the ciliary processes is practically unimpeded. That an increase in bulk in the ciliary region occurs in accommodation, has been noted by Tscherning who does not ascribe it, however, to the cause which I have given. He

says, "There is formed during accommodation at the anterior surface of the iris a circular depression—the peripheral border of which corresponding to the ciliary body rises in a peak while the central border presents a very gentle slope corresponding to the anterior surface of the crystalline lens."

It is now possible to add to this the further observation that the action of the ciliary muscle thru its traction on the hyaloid membrane, forces forward the lens of the vitreous, this pressing against the crystalline lens, forcing the denser nucleus against the more plastic cortex and causing the anterior part of the crystalline to protrude to just the degree needed to give the required focal length. The action produced in this way is in perfect harmony with all of the observed facts. It is accomplished easily, quickly, and under normal conditions without strain. (Refer to figure 2.) The figures were very kindly drawn for me by Dr. W. H. Phillips.

The segmental action of the ciliary muscle explains in the only possible way the production and the correction of lenticular astigmatism. It is the only reasonable explanation of the existence of focal adaptation in the absence of the crystalline lens. It makes clear the pathology of the softening of the ocular structures in malignant myopia and of the changes occurring in progressive corneal astigmatism. The acceptance of this new theory will require the writing of a new ocular pathology based upon a fuller understanding of the actual changes which occur in the accommodation in the human eye.

#### ADDITIONAL CASE.

The following are the notes of a second case, in which the patient had a wide focal range in the absence of the crystalline lens. A man seventy-two years old in normal good health I operated on for mature cataract by combined expression on the 20th of October, 1920. A vertical upward iridectomy was the width of the pupil,  $2\frac{1}{2}$  millimeters. The pupillary area was



clear; a slightly opaque portion of capsule remaining above, but leaving a clear area of an average diameter of  $2\frac{1}{2}$  millimeters. The mires of the ophthalmometer overlapped half a diopter at 15 degrees. Details in the eye ground could be easily seen with a plus 4. The refraction was as follows: Right eye (operated eye), plus 11 D. sph. plus 2 D. cyl. axis 15 vision equals 20/20ths less 2 letters. Without glasses with the operated eye he is able to pick out words in Jaeger 6 at a distance of 5 inches. With his distance correction he is able to read Jaeger 1 easily at any point between  $9\frac{1}{2}$  and 22 inches. He prefers

an addition of plus 1 over his distance glasses for reading. He read the newspaper during an entire evening with his distance glasses, without changing their position before his eyes, without discomfort and found that the use of his distance glasses alone, for all purposes is so comfortable and convenient that he declines any additional correction for reading. He has evidently the equivalent of a range of accommodation that would be found in a person under 40 with accommodative power. There was, of course, no change in the position of his glasses in making the tests and the paper was held in the normal position before his eyes.

## WHY WE ACCOMMODATE.

CLARENCE LOEB, A.M., M.D.

CHICAGO, ILL.

This paper sets forth a hypothesis regarding the method in which light falling upon the retina incompletely focussed may provoke the muscular action required to secure its accurate focussing. Read before the American Academy of Ophthalmology and Oto-Laryngology, October 14, 1920.

It would seem supererogatory to bring up the subject of accommodation before this society, since the main facts of the mechanism of accommodation are well known to all of you. And yet, conversation with some of our best informed members has failed to bring an answer to the question of *why* we accommodate, and I do not recall ever having seen in the literature an explanation. It seems to have been accepted as a fact, without exciting any special interest in the reason, like many other common occurrences.

This question may be stated in a somewhat different form, namely, what phenomenon occurs within the eye when an object is brought from 6 meters away to 1 meter from the eye, that sets up the train of events culminating in an increase in the curvature of the lens of sufficient amount to enable the individual to see it distinctly at the latter distance? Conversely, what occurs when the object is moved from the latter to the former distance that causes a reversal or nullification of the previous state, so that the curvature of the lens becomes less?

It is perhaps impossible to obtain an answer to these questions whose correctness can be proven, but it is at least possible to discuss the factors entering into the problem, in an attempt to formulate a theory which will satisfactorily explain the initiation of the act of accommodation.

In the following discussion, the associated acts of convergence and contraction of the pupil will be disregarded, for while they are synergistic, they are not essential to the act of accommodation. Convergence may take place when the accommodation of one or both eyes is paralyzed, and conversely, accommodation is still present in the remaining eye when one has been removed. Paralysis of the accommodation is usu-

ally associated with paralysis of the sphincter iridis, but the reverse is not always true, since it is possible to dilate the pupil without affecting the accommodation, for example by decreasing the amount of light entering the eye. Therefore it is possible, from a causal standpoint, to regard the act of accommodation as an isolated one.

When an object is brought closer to the eye than 6 meters, two physical facts follow: in the first place, the visual angle formed at the eye by the rays from the extremities of the object becomes larger, and this increase is proportionate to the proximity of the object to the eye. In the second place, the rays of light originating at any point on the surface of the object, after passing thru the dioptric system of the eye no longer meet at their former focus, but at some point posterior to it, dependent on the proximity of the object to the eye. This of course assumes that the accommodation is inactive.

Within certain limits, the size of the visual angle determines the size of the image formed on the retina. Now it is conceivable that as soon as the retinal image has increased beyond a certain size, or in other words, as soon as the rays from the extremity of an object have formed an image which extends over a certain number of rod and cones, a stimulus travels up the optic nerve to the centers of accommodation, convergence and pupillary contraction, which brings about these acts. While this is possibly true for pupillary contraction, it is certainly not true for the other two. Leaving convergence out of consideration, if accommodation were evoked by the varying size of the retinal images, the same sized retinal image should always cause the same amount of accommodation in the same eye, at least at the same period of life.

But this is not true, because the image formed by an object 2 feet away from the eye is of the same size as that formed by an object 10 times its size 20 feet away, as shown by the diagram. In the former case there will be an act of accommodation, while in the latter there will be none. (Fig. 1.)

Except when the focus is on the retina, the rays from any point on the object reach the retina in the form of a circle, as seen in the following diagram. (Fig. 2.)

Let  $L$  be the dioptric system of an eye, and  $H$ ,  $E$ , and  $M$  be the positions of the retina in the case of hyperopia,

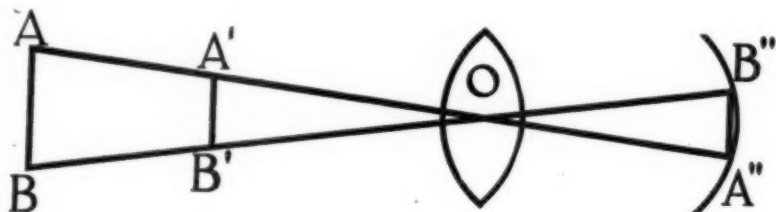


Fig. 1.

Showing image of the same size formed by different sized objects at different distances.

Let  $AO$  and  $BO$  be the rays of light from the extremities of the object,  $AB$ . Then  $AOB$  will be the visual angle, and  $B''A''$  the image. But  $B''A''$  will also be the image of every object thru whose extremities the rays  $AO$  and  $BO$  pass, for example  $A'B'$ .

The second fact might be stated somewhat differently, namely, that as an object approaches the eye, the focus

emmetropia and myopia, respectively. Let  $OA$  and  $OB$  be two rays from the point  $O$  on an object closer to the eye than 6 meters. Then  $A'B'$ ,  $A''B''$  and  $B'''A'''$  will be the diameters of the circles formed respectively upon the retinas  $H$ ,  $E$ , and  $M$  by all of the rays originating at the point  $O$ . The size of the circles in the emmetropic and hyperopic eyes is directly propor-

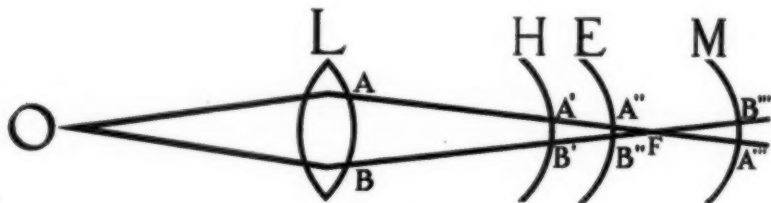


Fig. 2.

Rays not focussed on the retina forming circles of diffusion.

of the rays arising from any point on its surface recedes, assuming that the accommodation remains quiescent. If we are dealing with a myopic eye, the focus will pass thru three stages, in front of, on, and behind the retina, according as the object approaches, reaches and passes within the far point of the eye. In a hyperopic eye, and in an emmetropic one, after the object has approached closer than 6 meters, the focus is always back of the retina.

tional to the proximity of the object to the eye, and in the myopic eye is indirectly proportional until the object passes within the far point when it is directly proportional. Now the amount of accommodation is also directly proportional to the proximity of the object to the eye, and it would seem a logical deduction that the amount of accommodation is directly proportionate to the size of these circles, and that therefore the appearance of and

the varying size of these circles is the direct cause of the act of accommodation. But this cannot be true, because it is possible for an object at an infinite distance to form circles on the retina of a myopic eye of the same size as those formed on a hyperopic eye. This is shown by the following diagram. (Fig. 3.)

sented by connecting the various points formed by the intersection of the retina by the rays coming from any one point on the surface of the object. At the same time these intersected rays impinge upon and stimulate a certain number of retinal nervous elements, as shown by the following diagrams. (Fig. 4.)

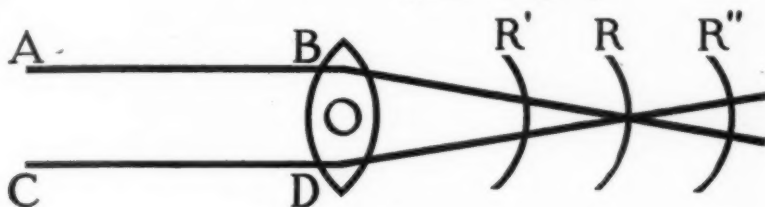


Fig. 3.

Circles of diffusion of the same size formed in hyperopia and myopia.

Let AB and CD represent rays coming from a point on an object at an infinite distance from the eye. When they reach it they are practically parallel. Let O represent the dioptric system of three eyes, one hyperopic, one emmetropic and one myopic. Let R', R, and R'' represent the positions of the retinas of the respective eyes.

Let B'I' be two refracted rays from a point on an object situated at an infinite distance from a hyperopic eye, whose retina, R R' is intersected at the points L and L'. Let BM' and DM be two refracted rays from an object at an infinite distance from a myopic eye, whose retina, S S', is intersected at the points M and M', after the rays

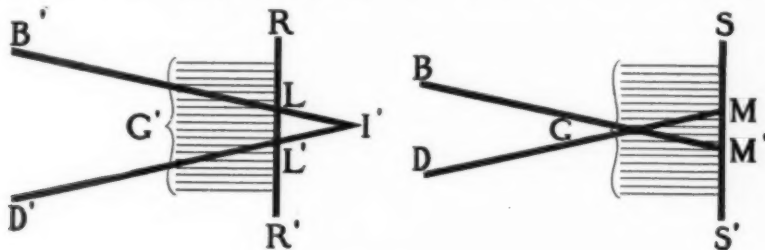


Fig. 4.

Showing obliqueness of rays falling on the layer of rods and cones in hyperopia and myopia.

The focus falling on R, there will be no circle in the emmetropic eye, but there will be on R' and R'', and if they are at the same distance in front of and behind R, respectively, the circles formed will have the same diameter. But in the hyperopic eye there will be an effort of accommodation, whereas in the myopic eye there will be none. Of course, these circles are very small, but they exist in the nonaccommodating eye, and may be graphically repre-

have passed beyond the focal point of the dioptric system of the eye. Let L L' equal M M'. Let G' and G be respectively the retinal elements traversed by the rays of the respective eyes. If these diagrams are compared, it will be seen that there are two distinct differences in the relation of the rays to the retinal elements in the two eyes. In the first place the number of elements traversed by the rays in the hyperopic eye is apparently greater



than in the myopic eye. If the object were very close to the hyperopic eye, or if the myopia were very low, this factor might enter into the problem. But as a matter of fact, the numbers of elements involved must be very small in any case, so that this feature of the problem may be disregarded. But there is a distinct and outstanding difference. In the hyperopic eye, the rays are converging, or in other words they are passing obliquely thru the nerve elements, in a direction from the periphery towards the center. In the myopic eye, however, they also pass obliquely, but the direction is from the center towards the periphery. This difference in the obliqueness of the rays is, in my opinion, the cause of the presence of the accommodation in the hyperopic eye and its absence in the myopic one, when the object is beyond its far point.

Let us see what will happen in the various eyes when the position of the object is changed. In the hyperopic eye, the closer the object is to the eye, the further back is the focus of the rays, the larger is the diameter of the circles, the greater the obliqueness of the rays in passing thru any one retinal element, and the greater the effort of accommodation. Conversely, the further away the object is from the eye, the closer to the retina is the focus of the rays, the smaller the diameter of the circles, the less the obliqueness of the rays passing thru any one element, and the less the effort of accommodation. Since the object cannot recede beyond infinity, and since the relation of the retina to the dioptric system of the eye is such that the rays are always focussed behind it, the rays always pass obliquely converging thru the retinal elements and there is always an active accommodation present, provided the ciliary muscle is active.

In the myopic eye, on the other hand, the closer the object is to the eye, provided it is beyond the far point, the nearer the focus of the rays to the retina, the smaller is the diameter of the circles, and the less the diverging obliqueness of the rays. At the mo-

ment the object comes closer to the eye than its far point, the focus passes beyond the retina and the direction of the obliqueness of the rays changes from a diverging to a converging. Simultaneously, an effort of accommodation is initiated. From this point the sequence of events is the same as in the hyperopic eye. Conversely, as the object recedes from the eye, there is a decrease in the converging obliqueness of the rays, accompanied by a decreasing amount of accommodation, until the far point is passed, when they are replaced by diverging obliqueness and absence of accommodation.

In an emmetropic eye, when the object is at infinity, the focus lies on the retina, and the rays are converging as they reach the retina. In the drawings, the size of the retinal elements has been greatly exaggerated, nevertheless, they have a certain height and must be cut somewhat obliquely converging. Theoretically, at least, an emmetropic eye must be exerting some effort of accommodation, even when looking at an object at an infinite distance. When an object lies at a finite distance from the eye, the sequence of events is the same as in the hyperopic eye.

The theory which I would offer to explain the causation of accommodation, is, therefore, the following:

(1) The act of accommodation is caused by rays of light from any point on the surface of an object passing thru the perceptive elements of the retina while still converging, or passing in an oblique direction from the periphery towards the center.

(2) The amount of accommodative effort is directly dependent on the obliqueness with which the converging rays reach or pass thru the retinal elements.

(3) Altho the mechanism of accommodation is of phylogenetic origin, accommodation itself is an acquired act, due to the individual learning from his experiences that certain sensations due to converging obliqueness of rays mean that an object lies closer to his eye than their far point, requiring certain muscular efforts to permit it to be seen

distinctly. This takes place so early in the life of the individual, that by the time he is a few months old it has become subconscious or involuntary.

As corollaries to this theory it should be true that:

(1) The act of accommodation should always be present in a hyperopic eye.

(2) The act of accommodation should be present in an emmetropic eye when the object looked at is at infinity (or its equivalent, 6 meters), but especially when it is at a finite distance.

(3) The act of accommodation should be present in a myopic eye whenever the object looked at is closer than the far point of the eye.

(4) The act of accommodation should be present in any eye when the rays reach it after passing thru a concave lens sufficiently strong to alter their course so that they are converging when they reach the retina.

(5) The act of accommodation should be absent in any eye when the rays reach it after passing thru a convex lens sufficiently strong to alter their course so that they are diverging when they reach the retina.

(6) The act of accommodation should be present in an astigmatic eye when either or both of the principal meridians refract the rays so that they converge as they approach the retina. The pain so frequently present in astigmatism is probably due to difference in the amounts and characters of the obliqueness of the rays passing thru the principal meridians, resulting in differences in the amount of stimulus towards accommodation, or even in a stimulus towards accommodation and a simultaneous stimulus towards relaxation of the accommodation. This

warring of stimuli or their effects causes the direct pain in the eye, or referred pain in the head, or reflex symptoms such as dizziness, malaise, or disease such as blepharitis.

(7) A myopic eye with active accommodation should accept a stronger glass than its real refraction because the tendency of a concave lens is to make the rays divergent. As soon as the focus is made to recede to the retina, there is evoked an effort of accommodation due to the converging obliqueness of the rays, which throws the focus in front of the retina, allowing a stronger concave glass to be accepted.

(8) A hyperopic eye with active accommodation can never accept a stronger glass than its real refraction, and usually will accept a weaker one, because the tendency of a convex lens is to make the rays converging. But the tendency of the accommodation is also to make the rays converging. When the sum of the two brings the focus on to the retina, there will be clear vision. Additional strengths of convex lenses will tend to bring the focus in front of the retina and vision will be obscured until the divergence of the rays after they pass the focus causes the accommodation to relax and allows the focus to recede to the retina. As soon as the accommodation is completely relaxed, additional strengths of convex lenses will cause the rays to diverge obliquely and vision will be obscured.

This theory is offered in the hope that it will bring out a discussion of this question, and if incorrect, will lead to an investigation and a solution which will be in conformity better with known facts.

## CRANIAL DEVELOPMENT FOLLOWING ENUCLEATION IN EARLY YOUTH—POSSIBLE EFFECTS IN ADULT YEARS.

GILFORD DICKINSON, M.D.

SYRACUSE, N. Y.

This is the report of a case in which the eyeball was enucleated at the age of three years. Great contraction of the conjunctival sac and other soft parts followed, with very marked alteration in the walls of the orbit, as shown by the radiograph.

It is interesting to note how strictly nature conforms with the general developmental laws with regard to the bony framework of the body. This is no less true, even where normal growth is interfered with and artificial conditions substituted.

The human orbit is composed of the frontal, malar, lacrimal, ethmoid, sphenoid, and superior maxillary bones. The frontal and external, or temporal portions of the maxilla, are by far the thicker and more sturdy portions of the orbit, this by reason of necessity for greater protection at the superior and temporal portions. The inner lower quadrant of the orbit is quite thin and capable of withstanding but little trauma. With these facts in mind one would expect that where the development of the orbit is interfered with, nature would respond by increasing the growth of the thin least resistive portions, but this is not the case. The tissue increase confines itself to those portions that are the heavier, and for the reason mentioned above, which necessitates the greater protection for the cranial cavity.

After enucleation in early youth the loss of orbital structures and tissue is at once resented and the organism attempts to replace the defect by such increase in surrounding bony framework as is possible. This is of course quite limited but yet sufficient to be worthy the attention of operators that they may devise a successful method of compensating for the tissue loss, thereby preventing some of the untoward results of later years. It will be noted that the attempt to close the defect is almost entirely from above downward. The extension of the frontal ridge in some cases is half the orbital cavity; and, as in the case illustrated below, the increase in the frontal sinus on the affected side doubles its normal size. The floor and external wall

remain practically the same as on the unaffected side.

The resulting enlargement of the frontal sinus on the affected side is of importance with regard to symptoms developing in later life, as it tends to be a selective site for focal infections of considerable extent. With such patent cells, and area of mucosa so great, a chronic infection of a mild type persists for years and is a constant source of annoyance, when it is not a direct causative factor of neuralgia of the ophthalmic branch of the fifth nerve.

The great discomfort, very often unbearable pain, suffered by these patients; the few and too often unsuccessful remedies at the disposal of the physician, together with the chronicity of the malady, makes the solution of the problem most desirable.

The following is a report with photographic radiograph of a typical case.

### CASE.

Mrs. W., age thirty-five years; three healthy children; no premature labors; Wassermann negative; has had no previous illness other than the common diseases of childhood.

At the age of three or four years, the left eye was enucleated, the cause of this operation not being entirely clear at present, but as near as can be determined there was a penetrating injury, and sympathetic ophthalmia was feared. No attempt at any tissue replacement was made. The recovery was uneventful.

When about ten or twelve years old there was a recurrence of severe pain in the orbit and surrounding areas. This was attributed to "rheumatism" and nothing was done to relieve it. This attack was limited to a couple of weeks after which there was freedom from pain for about a year. At the time of the next attack the suffering was so

acute that the oculist was consulted, who advised another operation; just what was done at this operation is not known. There was no cessation from pain in spite of the operation, and the child was taken from school and sent to the country for a rest.

After being on a farm for a week or so the pain entirely disappeared; and as

physician and "chiropractic" being without avail, the suffering continually grew worse until the patient was unable to either sleep or eat, and when seen by the writer early in June she was extremely nervous, under weight, and on the verge of collapse. The lids and surrounding skin areas were so sensitive as to make examination impossible at this

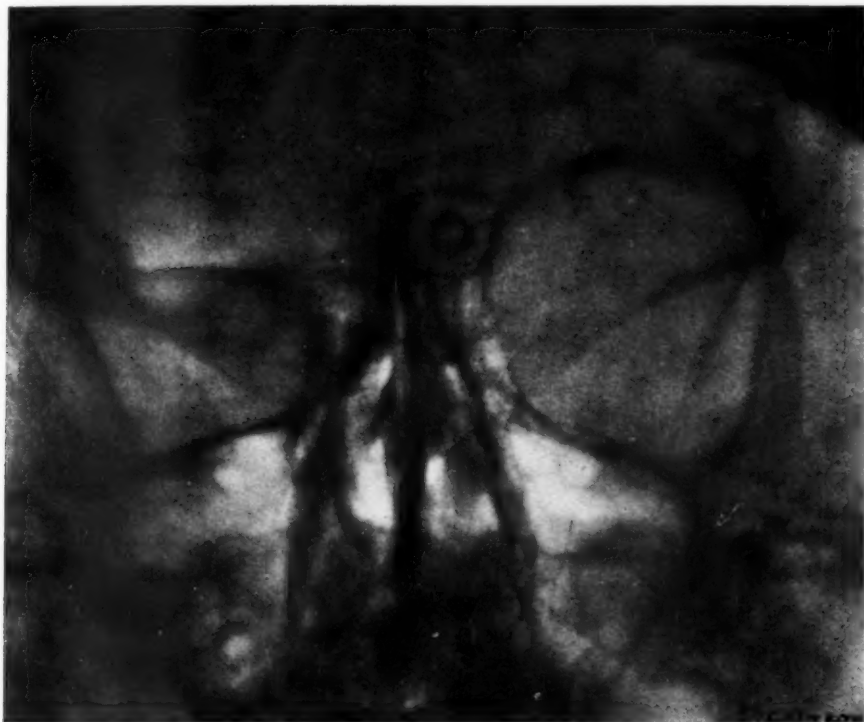


Fig. 1.—Radiographs of orbits and adjoining parts in adult after enucleation of left eye in early childhood. Overgrowth of bony walls of left orbit, especially above; with enlargement of left frontal sinus.

it did not recur, she again returned to the city and resumed her studies. It might be added here that nothing was worn in the orbit, but it was covered with a ground glass spectacle.

The patient had been free from any recurrence of the trouble until she was about twenty-nine years old, at which time she had a mild attack which yielded to the treatment as prescribed by the family physician.

The next attack commenced in January of this past year and was the most severe yet experienced. The efforts of

time, so the patient was sent to the hospital for rest and general building up.

After four days, a careful examination showed the upper lids firmly adherent to the orbital conjunctiva, in such a manner that the greatest palpebral opening possible was less than four mm. The radiograph is reproduced and shows the contracted orbital cavity. It was decided to operate and free the lid as far as possible in hope that the removal of the contracted scar tissue might afford relief; as it was possible that it caused tension or traction on the supraorbital



branch of the ophthalmic division of the nerve.

At the operation the entire lid was freed, and some of the scar tissue removed, especially that portion adjoining the periosteum of the roof of the orbit. What conjunctiva could be picked up was drawn together with silk, and a sterile rubber insert placed between it and the lid. After four days the rubber insert was removed. Recovery was uneventful and the lid remained free. The pain ceased following operation and up to the present time there has been no recurrence of the trouble. The size of the orbital cavity makes it impossible to make use of an artificial eye of any type.

It is the writer's belief that the pain

will again recur at some future time, and that the temporary relief following operation was due to removing some traction on the nerve which will again obtain when the remaining tissue contracts sufficiently. That the irritation of the nerve was caused by the contracted orbit, due to the bony overgrowth is open to question; and can only be ascertained by checking a large series of such cases which is not an easy matter as the space of time elapsing is so great. However it would be interesting to note the results as seen by radiograph in cases of enucleation in children where implantation methods are used, could these cases be followed to adult life.

## BLEPHAROCHALASIS WITH PTOSIS; REPORT OF A CASE.

EDWARD B. HECKEL, M.D.

PITTSBURGH, PA.

This is the report of a case and of the microscopic examination of the excised tissue. Read at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, October, 1920.

The condition known as blepharochalasis is sufficiently rare to warrant the report of even a single case. This name was suggested by Fuchs in 1896, when

stretched, relaxed and falls into many small folds.

In 1913 W. B. Weidler of New York presented a comprehensive study on ble-



Fig. 1.—Case of blepharochalasis affecting right upper lid. Wrinkled redundant skin. Left eye normal.

he reported a series of cases. The condition, however, had been recognized before and attention called to it by Mackenzie in 1854. A number of terms have been used to describe this condition, e. g. "Ptosis cutaneae," "Dermatolysis palpebrale," "Paupières en besac," "Pseudoleukemia lymphatica," and "angiomegalie de paupières." But blepharochalasis seems to be the most appropriate, as the word itself means lid-relaxed, and there certainly is a relaxed condition of the skin. The skin is thin,

pharochalasis before the section on Ophthalmology of the A. M. A., reviewing the previous literature and adding two cases of his own. Since then Edward Stieren of Pittsburgh reported two cases in 1914 before the American Ophthalmological Society, and in 1916 R. L. Randolph of Baltimore reported one case before the same society.

It is a condition of early life and usually found in girls between the age of eight and nineteen years. Weidler thinks there is some connection between

the appearance of the menstrual period and the development of the condition known as blepharochalasis. The concomitant appearance of this condition, however, with the menstrual function in some isolated cases, is not sufficient to warrant the conclusion that it is a causative factor. It is false logic, in fact a

words can tell. In all of the cases heretofore reported, I believe, the condition has been bilateral and there was not complete ptosis. In the case about to be reported the condition was monolateral, with a complete ptosis, which raises the question whether or not ptosis is not always a concomitant condition in mono-



Fig. 2.—Case shown in Fig. 1 after operation; excising crescent shaped piece of skin and subcutaneous tissues with some orbital fat.

case of "post hoc ergo propter hoc." There may be, however, some relation between an angioneurotic edema and the development of this condition, for it seems that it may begin as an edema of the subcutaneous connective tissues, which later results in a loss of elasticity and a consequent stretching of the skin and an atrophy of the subcutaneous tissues of the lid. Just why it involves the upper lid only, no one has attempted to explain.

Figure 1 illustrates this condition of the skin with its redundancy and thin tissue-paper like appearance, better than

lateral cases and absent in bilateral cases.

Miss Ethel S., age 19 years, family history negative, has always lived on a farm, physical condition good, subsequent laboratory tests negative. Began to menstruate at fourteen years, at which time it was first noticed that the upper lid would swell at times with a slight droop. This droop gradually increased so that it soon became complete. The left eye was negative. (See Fig. 1.)

It has been suggested by some writers that in this condition there is a hernia of orbital fat. The protrusion of the eyeball was measured by the exophthalmom-

eter, and the right eye, the one with the blepharochalasis, was found to protrude 3 mm. beyond the left. Some months after the operation another reading was made and no protrusion or exophthalmos was evident.

The refraction of the eyes was as follows:

R.V. 20/200, and 20/30 with +1.75 s.

L.V. 20/20, and 20/20 with +1.00 s.

On November 22, 1915, the patient was operated, by excising a crescent shaped piece of skin with the subcutaneous tissue and some orbital fat. The wound was stitched with interrupted sutures, seven in all. The middle suture

was passed down into the tarsus of the lid. The healing was prompt and uneventful. The result after operation is shown in Fig. 2.

MICROSCOPIC EXAMINATION.—The excised section consisted of skin, subcutaneous tissue and adipose tissue. There was a thickening of the stratum corneum with flat epithelial cells in many layers. There was an absence of adipose tissue in the corium and general atrophy of the papillae. The stratum reticulatum was deficient in elastic fibres, showing a general atrophy. There was wide separation of the fibres in the subcutaneous cellular tissue, suggesting a preexisting edema.



# NOTES, CASES AND INSTRUMENTS

## APHAKIA, NEAR VISION WITH DISTANCE GLASSES.

WM. R. FRINGER, M.D.

ROCKFORD, ILL.

On November 2, 1903, I did an extraction after a preliminary iridectomy on the right eye of Mrs. Wm. Harvey, aged 53.

Dec. 29, 1903, R. + 11.  $\odot$  + 1.50 axis  $120^\circ$  vision equals 20/20ths.

The immature cataract in the left eye had advanced to such an extent that she was now dependent upon the operated eye for her seeing eye. The above correction was ordered for distance and she was to return in 3 or 4 weeks for her near correction. When she returned she stated that she could read with the glasses she had. She was able, without changing the position of the glasses on her nose, to read Jaeger No. 4 at 16 inches and continued to do so until Oct. 15, 1904, when I did a needling on the right eye because the vision had fallen to 20/70ths. After she recovered from the needling, with the correction she was then wearing plus 11.  $\odot$  plus 1.50 axis  $120^\circ$ , her vision returned to 20/20ths and she continued to use the above lens for distance and near with comfort, and of course without changing the position of the frame on her nose. On January 15, 1907, I did an extraction on the left eye following a preliminary iridectomy.

February 13, 1907. Left eye + 10.50 = 20/30ths.

Correction ordered.

May 4, 1911. Right eye + 10.  $\odot$  + 1. cyl. axis  $120^\circ$  = 20/20ths.

Left eye + 11.50 = 20/20ths. She wore this correction with the ability to use each eye for distance and near until April 19, 1915, when I did a needling on the left eye because vision had dropped.

April 28, 1915, L. E. + 11.  $\odot$  + 0.50 axis  $180^\circ$  equals 20/20ths.

June 24, 1915, R. E. + 10.  $\odot$  + 1. axis  $120^\circ$  equals 20/20ths; L. E. + 10.50  $\odot$  + 0.50 cyl. axis  $180^\circ$  equals 20/20ths.

With this correction she used her eyes for distance and near until March 21, 1918, when she came to me with the statement that her eyes tired when she used them for near. She still had the ability to read Jaeger No. 4 at 16 inches.

Right eye + 11.  $\odot$  + 0.75 axis  $120^\circ$  equals 20/20ths.

Left eye + 10.50 equals 20/20ths.

With the correction, with the right eye she read Jaeger No. 4 at 16 inches, and the left eye Jaeger No. 3 at 16 inches. I ordered in Kryptoks the above correction with plus 2.50 added. I did not see her again until Oct. 22, 1920, when I phoned her to come to my office. With her distance correction she is able to read with right eye at 16 inches Jaeger 4 and with the left J. 6. She had the ability to read with her distance correction both before and after the needling operations. In the right eye the opening after the needling was very small, and is now clouded over by a very thin membrane which renders the fundus slightly hazy. The opening after the needling in the left eye was large and still remains so.

Mrs. Harvey was an excellent patient. The recoveries after the various operations were uneventful. She is a woman in comfortable circumstances. She has been in Scotland and California once, if not more, since wearing her cataract lenses. She read a good deal and sewed also. She tells me that she never had any trouble in threading her needle.

## PARALYSIS OF ACCOMMODATION FOLLOWING A PERITONSILLAR ABSCESS.

J. WARREN WHITE, A.B., M.D., F.A.C.S.

NORFOLK, VA.

This case was referred to me by Dr. R. S. Spilman of Norfolk, Virginia, with the following history:

He first saw the girl on September the second. She was 9 years old, and had been sick in the country several days before being brought into the city.

On examination he found a peritonsillar abscess on the right side which was immediately incised.

He took two cultures from the throat at different times and they were both negative as to the Löffler bacillus.

The case was seen by me on September the 30th, with the following complaint, constant headaches and being unable to read at school.

The vision was 20/100 o.u. There was a complete paralysis of accommodation but no paralysis of the sphincter pupillae. A plus 2.50 sphere o.u. gave her 20/30 plus o.u., and plus 2.00 sphere o.u. had to be added for reading.

I gave her strychnin sulphat with increasing doses, and October the 21st plus 1.75 o.u. gave her 20/30 plus o.u. and plus 1.00 o.u. had to be added for reading. On October the 28th, her vision was 20/20 o.u. and she was able to read without any difficulty.

### BLINDNESS FROM METHYL ALCOHOL POISONING.

V. R. HURST, M.D.

LONGVIEW, TEXAS.

E. S., age 47, on May 4, 1920, drank a large quantity of methyl alcohol. Examination five days later showed vision O.D. no light perception, O.S. counting fingers at 3 feet. The pupils were equal, round and moderately dilated. The media of both eyes were clear and ophthalmoscopic picture was one of a neuroretinitis, the left, with some vision, showing more edema of disc than did the right, which was totally blind.

Under the usual treatment the vision in the left eye improved rapidly, but when he was able to return to work he found that he could not distinguish the flame of a fire nor the bulb of an electric light. This I have called "flame blindness." In lighting an oil heater he knew that it was burning only by feeling the heat as the flame was not visible. When the vision had improved to 6/60 he could not locate a 100 C. P. light. The color vision was normal, but the visual field was much contracted, especially for red.

The patient remained intoxicated a large part of the time, and failed to return as often as necessary to give a complete history. Notwithstanding his imprudence the vision in the left eye im-

proved until now, seven months later, it is 6/6, with light (flame) perception normal, but the field much contracted. Vision in the right eye is counting fingers at 3 feet, with no central flame perception, but can slightly distinguish a light by holding it at the periphery of the visual field.

### PAPILLITIS; GLIOMA OF THE BRAIN.

G. N. BRAZEAU, M.D., D.Oph., F.A.C.S.

MILWAUKEE, WIS.

Inflammation of the terminal end of the optic nerve is of two kinds. The first, essentially inflammatory in nature, reveals all the characteristics of true inflammation and manifests itself by purely functional troubles. The second variety, with which this paper will deal, is papillitis by stasis, of von Graefe. These two types are not as markedly different as one might at first believe, so, in view of their different consequences, they should be considered separately as distinct morbid entities. The papillitis by stasis will be best illustrated by reviewing a case that consulted me for failing sight. Briefly, this is the history:

A man, age 60, nationality Irish, a farmer, history good, has always been well and strong up to about the time his sight began to fail. This was his chief complaint. There was no headache, no vomiting, nor paralysis. V 20/50. The eyes appeared normal. Fundus examination showed a typical picture of bilateral papillitis, with its tortuous and engorged veins and filiform arteries. The nerve head looked like a mushroom, projecting into the eye. There were no signs of retinal hemorrhages and the borders of the disc were very blurred in the mass of edematous swelling and capillary distension. Further observation revealed recurring spasms of the muscles of the right side of the face, motor aura, like a grimace. During these spasms there was a tendency to fall forward, tho no loss of consciousness. These spasms would last about a minute to recur again at varying intervals during the day. Here was a typical case of Jacksonian epilepsy of the facial

type. The diagnosis seemed easy in such presence; it was papillitis due to a tumor of the brain, with Jacksonian epilepsy.

The character of the neoplasm was undetermined as the case was lost to further observation. The good history of the patient assisted materially in differentiating between a neoplasm and the various other causes capable of producing such papillitis. There were no evidences of either meningitis, tuberculosis, syphilis or sinuitis.

Gliomas of the brain substance probably lead in frequency and in malignancy among the brain tumors. However, independent of its nature there was a tumor, most probably a glioma involving the inferior cortical portion of the ascending frontal convolution. From the restricted epileptiform seizures, we can assume the tumor to be a small one. It is regrettable that the Roentgen rays should be powerless to assist us in either localizing or determining the size of these tumors of the soft tissues, for only where deposits in these growths occur, is there sufficient visibility to be worthy of attention. Thus are we referred to the autopsy room for positive information. In choked disc, the vision may be but slightly altered, while inversely, there may be marked diminution in vision and color, with no ophthalmoscopic findings in the first form. A periodic loss of vision testifies to a tumor. These, together with the Jacksonian epilepsy, leave no doubt as to the cause of the papillitis. In one hundred cases of brain tumor, papil-

litis was present in 95% of them. Among the many reasons given in explanation of this edema, that of obstruction to the returned circulation has received the most credence. It was Graefe's idea. The edema in and about the nerve are explainable on the grounds of the intercommunicability of the spaces between the membranes covering both the brain and the optic nerve, as the latter membranes are but a continuation of the former serving the nerve as sheaths that extend even unto its entrance to the sclera.

The prognosis, in cases such as this, where the edema papillaris is due to pressure, is distinctly dependent upon the cause and its amenability to treatment, as well as on the time of its duration. In impaired vision, where relief is at our command, the prognosis is naturally better the earlier intervention is initiated. In malignant growths, or those more inaccessibly placed, or because of extensive metastasis, the prognosis both as to life and vision is of the worst. With the progress of disease, other symptoms, more complicated and disheartening appear, until finally death supervenes to end the tragic scene following coma, paralysis, hemorrhage, or all. With the present advance of brain surgery, cases seen early may, and have been very happily benefited. In papillitis, due to sphenoidal sinuitis much hope can be entertained owing to the ready accessibility of this sinus to surgical and medical intervention.

# SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

## BELGIAN OPHTHALMOLOGICAL SOCIETY.

November 28, 1920.

### Congenital Anomalies of the Fundus of the Eye.

MARCEL DANIS read a paper upon this subject published in full in this JOURNAL, page 233.

#### Proliferating Chorioretinitis.

DR. DANIS read the paper published in this JOURNAL, p. 153.

#### Cysts of the Retina.

DR. DANIS also presented a woman aged 57 in whose right eye there were two spherical transparent tumors upon which vessels were to be seen. These tumors extended into the vitreous and showed no movement. One of them was situated on the temporal side of the papilla which it covered in part. The other was situated on the nasal side and a little below. They were regarded as two cysts of the retina.

#### Congenital Pigmented Structures of the Pupil.

PROF. D. VAN DUYSSE, Gand, called attention to the excrescences, fringes, pads and protrusions of the pupillary margin, derived from the ectodermic pigment layer of the iris. Generally they are localized in the upper part of the pupil and are symmetric. They have an interest as evidences of atavism suggesting the erectile processes of ruminants or the operculum. They are quite distinct from acquired uveal ectropion, following iritis or in chronic glaucoma. They must also be distinguished from pigmentary deposits encroaching on the anterior surface of the iris, such as pseudocoloboma described by Cosmettatos and Fejer in 1905. In the case of Fejer the pigmented portion stood out from the surface of the stroma. This part of the iris being thicker could not be confused with thinning, the absence of the stroma, the superficial coloboma of von Ammon, partial irideremia of

Gloor and Folte. The condition is the reverse of that reported by Fejer.

#### Annular Dystrophy of the Cornea.

H. COPPEZ, Brussels, presented a patient aged 40 years, who had suffered for about four years with annular dystrophy of both corneas. The affection began with isolated whitish islets, which had appeared on the cornea without any inflammatory reaction and which subsequently became confluent. Actually one observes on both corneas whitish rings of which the external boundary is about 1 mm. from the corneal limbus, leaving free between a narrow zone of corneal tissue. The internal boundary corresponded almost with the pupillary margin. This ring was caused by a deposit of little crystals easily seen with the slit lamp of Gullstrand. Even in the part of the cornea which seems healthy, in front of the pupil, one discovers branching crystals. The anterior chamber seems more deep than normal, the visual acuity is normal. The appearance of the patient is most peculiar. At first sight he seems to be suffering from total leucoma with tattooing of the center. The case is very unusual. The author has not encountered a similar one in the literature.

#### Keratomalacia in Healthy Children Cured by Testicular Extract.

KLEEFELD, Brussels, reported that in two cases of grave keratomalacia subconjunctival injections of a glycerin extract of testicle provoked an intense congestion of the conjunctival and episcleral vessels, followed by chemosis which varied with the dose injected. The injections were used every other day, and produced an active ocular congestion persisting the day after.

Injections of pure glycerin also caused strong congestion and chemosis, but the effect is much more marked with the testicular extract. Of the two cases one presented a perfect cure except that some nebulae re-



maintained. The other, arising from an ulcer caused by injury by a finger nail, resulted in preserving the integrity of other parts of the cornea.

#### Ocular Prosthesis by Modeling.

PROF. WEEKERS, of Liege, said that the procedure for prosthesis he described was born of the war. During the first years of the war it was difficult to procure a prosthesis for the injured. The makers could not meet the excessive demand, could not furnish artificial eyes in series. Hence the necessity to make for each case a prosthesis to measure.

The process includes first, a mould of the orbital cavity by means of paraffin melting at 40° C. This mould serves as the basis for the modeling. Next it is hollowed out by means of a bistoury giving to it the concavity necessary to assure good adhesion to the deep tissues. Third, paraffin is run on the anterior face to give the prosthesis the same prominence as that of the sound eye. To arrive at this result a piece of paraffin is put in place and more is added or part is removed according to the needs of the case. Fourth, to indicate on the paraffin mould the proper position for the pupil. The model thus obtained is then reproduced in vulcanite. This model which can be kept indefinitely is sent to the maker of artificial eyes with the necessary directions concerning the color of the iris, the size of the cornea and the size of the pupil.

The results obtained are very satisfactory from the esthetic point of view, particularly in the difficult cases, where the orbital cavity is contracted or there are cicatricial bands. The procedure is more rational than the empiric method of choosing an eye from a certain assortment.

#### Siderosis of Crystalline Lens Without Clinical Evidence of Any Fragment of Iron.

D. VAN DUYSE of Gand, and M. DANIS of Brussels, reported this case. In a workman wounded in the eye by a splinter of cast iron they observed:

1. Under the anterior capsule of the crystalline lens a circlet of nine ochre colored foci with diffuse outline com-

posed of a collection of brown dust or granules more or less concentrated. Between these foci are fine russet spots occupying the pupillary area. (Siderosis speck.)

2. A few pigment spots are situated on the anterior surface of the crystalline.

3. A cataract approaching maturity.

The pigment spots upon the capsule might be congenital remains or pigment of uveal or iridic origin or blood debris. The subcapsular yellow spots are those of siderosis. The reason for their grouping in star form is not clearly explained. Examination with X-rays, the giant magnet of Haab and the magnetometer of Gallemaerts were negative. It is probable that the very small splinter of iron was completely transformed into a salt of iron which has no influence on the three methods of examination employed for the detection of intraocular magnetic foreign bodies.

#### Bordet Wassermann Blood Reaction in Ophthalmology.

RASQUIN, Namur, finds that this reaction with the blood, as ordinarily carried out, is not sufficiently sensitive for the requirements of ophthalmology. In effect it represents a test for the total activity of various syphilitic foci in the organism. The eye is a relatively small organ and does not produce a positive reaction if the ocular lesion is acute or exists without other syphilitic lesions. We must, therefore, in order to get a reaction, undertake a modified technic which will make it more sensitive. Rasquin employs the desensibilization of the serum. After having studied a series of cases the Bordet-Wassermann reaction and the reaction on the desensibilized serum he concludes that in ophthalmology the difference in the percentage of positive reactions is from 38% to 78%. He concludes his communication by reporting some observations that show the advantages of his perfected technic, which are numerous.

#### Action of Adrenalin in Ocular and Vascular Tension.

G. LEPLAT, Liege, read a paper on the Action of Adrenalin in Man upon

the Intraocular Tension and the Blood Pressure, both General and Retinal. Repeated successive observations on these pressures after the subcutaneous injection of  $\frac{1}{2}$  milligram of adrenalin prove that the intraocular tension remains unchanged in spite of the sharp transient elevation, variable in amount, but always noticeable, of the arterial systolic pressure, both general and retinal. The latter vary similarly. The same similarity of diastolic pressure is found in the radial artery and the central artery of the retina. It rises, remains constant, or sometimes slightly diminishes. The tension in the central retinal vein appears to remain constant.

#### **Relations Between the General and Ocular Circulations.**

H. COPPEZ and J. DE MEYER, Brussels, have noted that there is a hypertension, even a great hypertension which seems normal both from the general point of view and the ocular. On the other hand there is a very slight hypertension, even in some patients no hypertension, which presents the same effect as a great hypertension, angina, tachycardia, Bright's disease, retinal hemorrhages, neurorretinitis, etc. The conditions, paradoxical at first sight, are explained if one considers a factor that should often attract attention; the amplitude of the pulse.

For the same variation in pressure the amplitude of the pulse is proportioned to the elasticity of the arterial wall becoming less as the artery is more rigid or more distended. The amplitude of the pulse is estimated by means of the sphygmoscope of de Meyer to a minimal variation. In normal subjects one obtains tracings of 12 to 15 mm. amplitude. With hypertension considerable differences exist.

These authors exhibited a series of very demonstrative tracings. With subjects suffering from high tension 270-170 mm., the amplitude varies from 12 to 1 mm. It is interesting to observe that those patients having a normal amplitude presented no ocular lesions, and that those with reduced amplitude were attacked by neurorretinitis, hem-

orrhagic glaucoma, or retinal hemorrhages.

These facts were also observed with moderate hypertension, 200 mm. mercury, and even in patients whose vascular tension was normal. The authors report a man with hypertension (160-115 mm.) with a pulse amplitude reduced to 5 mm., who suffered from numerous symptoms characteristic of hypertension and notably from retinal hemorrhages.

As concerns the eyeball one observes in applying the tonometer of Schiötz that the lever sometimes shows oscillations synchronous with the pulse—the ocular pulse. Moore has measured these oscillations in 60 patients with arteriosclerosis. He noticed that the amplitude of the oscillations diminished to the proportion of increase of vascular tension, which agrees with what is reported above. Bailliart has also reported that in chronic glaucoma the amplitude of the ocular pulse is reduced. It results therefore from these observations that the question of the amplitude of the pulse has as much significance and importance in ophthalmology as in internal pathology.

#### **Fixation of Lids in Cataract Operation.**

RUBBRECHT, Bruges, after anesthesia and preparation of the lid margins, and external canthotomy, places a loop of wire in the middle of the border of the upper lid and another in the middle of the lower lid margin, the assistant holding each of these during the operation.

#### **Operative Treatment of Convergent Strabismus.**

HOORENS, Gand, made a statistical report of 200 cases of strabismus operated upon and followed up during several years. These patients were operated on by the following different methods:

1. Unilateral tenotomy.
2. Unilateral tenotomy combined with musculo-capsular advancement.
3. Double tenotomy.
4. Double muscular advancement (method of Landolt).
5. Tenotomy of the good eye.
6. Double capsulo-muscular advancement.

In strabismus of very slight degree Hoorens practises tenotomy of the healthy eye. In young patients whose recti muscles function well, and tenotomy of the deviating eye in older patients with insufficiency of the externi. For strabismus of moderate degree (20 to 30°) simple tenotomy of the amblyopic eye or tenotomy combined with capsulo-muscular advancement, and for moderate strabismus with good visual acuity, double muscular advancement.

In pronounced strabismus with the deviating eye amblyopic tenotomy is combined with musculo-capsular advancement; and in pronounced strabismus where the deviating eye has good vision, double muscular advancement. Finally, in very marked strabismus tenotomy combined with capsulo-muscular advancement, and in alternating strabismus, double muscular advancement or double tenotomy.

#### Deviations of the Head in Ophthalmology.

MARBAIX, Tournais, has observed such deviations in astigmatism, ocular palsies, or insufficiencies following tenotomy, ptosis, grave diseases of the brain, and nystagmus. He cited 6 cases.

1. Myopia of 2 D. in the left eye. For three months the head has been carried to the left, the eyes to the right. The left eye in adduction. This is contrary to the rule that the better eye is placed in adduction.

2. Deviation of the head to the right and both eyes to the left in connection with functional insufficiency of lateral movements to the right.

3. Right eye enucleated at the age of 18 months. Left eye in adduction, head to the left thru preponderance of the internal rectus over the external rectus.

4. Amblyopia of the right eye. The left eye, very hyperopic, is in adduction. The head turned to the left. After atropinization and correction of the hyperopia the head is held straight.

5 and 6. Lateral deviation of the head in nystagmus and good vision. The nystagmus is almost arrested by convergence. For distance the devia-

tion of the head and adduction of the eyes. With one of these patients the wearing of prisms of 10° apex to the nose allowed keeping of the head straight in nystagmus.

MARCEL DANIS.

#### MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNOLOGY.

December 14, 1920.

DR. J. B. BLUE, presiding.

#### Patients Operated on for Entropion.

DR. ELLETT showed a patient upon whom an operation for entropion had been performed November 9, 1920. Woman, age 42, with a history of sore eyes as long as she could remember. She showed the scars of trachoma, with entropion of both upper lids, pannus and a small corneal ulcer left eye. Vision was, right 18/200; left 5/200. Beard's "Altogether Operation" was done; intermarginal incision, canthoplasty, Hotz operation and a mucous graft from the lip between the edges of the intermarginal incision. Neither graft took, but the result is nevertheless very good. Vision in the left eye has improved to 10/200.

Dr. Ellett showed a patient upon whom he had operated for entropion; man, age 37. He had had inflammation of his eyes for about ten years. He presented the usual picture of chronic trachoma with slight entropion. The corneas, especially the left, were roughened and the vision reduced. The Hotz operation was done on both upper lids, November 16, under a general anesthetic. There has been a corneal ulcer in the right eye since the operation, but it is now healed and the patient is comfortable.

#### Coloboma of Iris, Choroid and Optic Nerve.

DR. ELLETT showed a patient with coloboma of the iris, choroid and optic nerve, right eye. Mrs. F., age 39, has always had poor vision in right eye, 2/200. L., 20/100. The left eye seems to have no other trouble than an error of refraction, but there is nystagmus

in both eyes. The right eye shows a coloboma of the iris to the periphery, down and a little in. The eye ground shows a large coloboma of the choroid, involving the optic nerve. The edges are lined with pigment deposits around the upper end of the defect, similar in distribution to the pigment changes in retinitis pigmentosa.

#### **Interstitial Keratitis.**

DR. ELLETT showed the son of the patient with coloboma of the iris, choroid and optic nerve, age 14, whom he had seen with interstitial keratitis 11 years ago. He also had a convergent squint, the left eye turning in 27°. This is said to have followed measles at two years. Treatment was not followed, tho there have been several prescriptions and also general treatment. Both corneas are quite opaque. Vision 20/50 and 10/200.

#### **Retinal Hemorrhages.**

DR. FAGIN presented a case of a retinal hemorrhage. Man, aged 22, a senior medical student, who had had seven retinal hemorrhages in left eye. The first hemorrhage occurred August 17, 1920; the others September 30, October 15, November 1, November 11, November 26, December 7. Different retinal vessels have been involved, both nasal and temporal, extremely peripheral in all instances. Sufficient in size to blur the vision to counting fingers. They soon clear and vision becomes good again.

DISCUSSION. Dr. Ellett said that the important thing here was to ascertain the cause, and remarked that influenza and tuberculosis were the commonest causes of hemorrhage.

Dr. Stanford said that he had seen the case with an obscured vitreous and thought it tuberculosis.

Dr. Fagin also showed a man 37 who had two hemorrhages, the first October 11, 1920, and the other November 27, left eye. Everything had been done to determine the cause of the hemorrhages, without result. Dr. Ellett did not agree that it was a case of hemorrhage.

#### **Rupture of Choroid and Retina.**

DR. BLUE presented a case of rupture

of the choroid and retina in a carpenter, age 40, who while driving a nail on September 23, 1920, was struck in the right eye by the nail. There was great pain and immediate dimness of vision, which continued some time. The vision has improved in the last two months. Vision now 20/70. The remaining evidence of the injury is a linear corneal scar to the temporal side, about 2 mm. from the limbus, and a vertical linear tear in the fundus at the outer side of the macula. This tear seems to have been in the choroid and the retina.

DISCUSSION. Dr. Ellett thought the tear confined to the choroid, as he saw the retinal vessels pass over the tear.

Dr. Stanford thought the retina and choroid each torn.

EDWIN D. WATKINS, Secretary.

### **BUFFALO OPHTHALMOLOGIC CLUB.**

December 9, 1920.

DR. RINGUEBERG, presiding.

#### **A New Retinoscope.**

DR. BENNETT described an original retinoscope in which the concave mirror was produced by silvering the convex surface of a plano-convex lens of one diopter, the plus one diopter lens being for the use of a presbyopic examiner. (To be published in this JOURNAL.)

#### **Hysteric Blindness.**

DR. PARK LEWIS reported a rather unusual case of hysteric blindness. A young man 22 years of age got a foreign body in one eye. It caused him some annoyance for two days, and suddenly while engaged in his work as an accountant he became blind in both eyes, so much so that he had to be led to the office. A cinder was found in the left eye, which had undoubtedly focussed his attention upon his sight. The boy was unable to distinguish light, but said he saw black streaks like pencils before his eyes. He had been in the army and was severely shaken up nervously. On being reassured, he was much better in twenty-four hours and had entirely recovered in thirty-six hours.



**Exophthalmos.**

DR. ARRELL referred to a patient exhibited at a previous meeting, in which there was paralysis of the sympathetic with slight exophthalmos. Dr. Park Lewis had suggested the diagnosis of Graves' disease and advised that a basal metabolism test be made. This was done shortly afterward. The metabolism was found normal. Dr. Cowper suggested that another metabolism test be made, as conditions vary from time to time. The photograph of the patient was exhibited.

**Retinal Hemorrhage.**

DR. ARRELL also reported this case. A young woman 20 years of age, a nurse in the City Hospital in Hamilton, suddenly became blind in the right eye from retinal hemorrhage. Later she suddenly became blind in the left eye from the same cause. Vision in the left eye was reduced to 10/200. In October she had an acute attack of appendicitis. Upon operation some grape seeds were found in the appendix. The only physical abnormality found was an enlargement of the posterior portion of both inferior turbinates. Since the operation for appendicitis she has improved very much.

DISCUSSION. Dr. Park Lewis said that most interesting work had been done by DeNiord on the blood, in the determination of focal infection. The conclusion reached by him was that if the blood analysis shows an excess of uric acid and nitrogen urea with a deficiency of adrenalin, no other cause being assignable, we can be assured that there is somewhere in the system a focal infection. Dr. Lewis referred to his own studies in retinal hemorrhages, in which he reached the conclusion that they were practically always dependent upon lysis of the retinal vessels rather than high blood pressure, even when syphilis and tuberculosis were present.

**Iritis.**

DR. PARK LEWIS reported two cases of iritis in patients who had been handling cows with inflammation of the eyes. There had been no opportunity to have bacteriologic tests made, but

it would be worth while to have such investigation made if further opportunities of like character should arise.

**Lenticonus Posterior.**

A Case of Lenticonus Posterior was reported for Dr. Clemesha by Dr. Blaauw.

DISCUSSION. Dr. Blaauw said: I have had the pleasure of seeing Dr. Clemesha's patient, a boy of about 12 years. When we first saw him about a year ago the diagnosis of posterior lenticonus was made. The picture was identical with the one in de Schweinitz's Textbook, and in the American Encyclopedia of Ophthalmology. I do not remember how the reflex of the posterior capsule was, but a luminous disc in the center of the papilla was seen, which was sharply limited by a dark border and the red periphery. The disc could be compared with an "oil drop"; it was, however, not absolutely transparent. Later we have been able to see the lens with the slit-lamp. The "oil drop" stood out as a very sharply confined globe, with "riders" which showed a radial position, the thicker part outwardly. The impression with the slit-lamp was not of a membrane, but of a rather sudden transition of refraction as observed in the nucleus of older people.

From many sides this lens condition is highly interesting. It gives the impression of a pathologic condition, sharply limited to the embryonal nucleus. He referred to the beautiful investigations of Prof. A. Vogt (Basel), who has shown the persistence of this embryonal nucleus during life; its vulnerability at the time of its formation can be demonstrated by the presence of the anterior axial embryonal cataract, so often found with the slit-lamp. He also mentioned Vogt's investigations of the remains of the hyaloid artery, which remain visible during life. Their place is at the nasal side of the posterior lens capsule, not at the pole, so that the theory of lenticonus being produced thru traction at the posterior pole cannot be strictly correct. It will be seen that with our

newer methods of investigating lens-conditions, the chapter on "lenticonus" posterior probably will have to be revised. The cases will have to be divided into:

1. The typical lenticonus posterior (bulging out of the lens).

2. The cases of the "oil drop," where the embryonal nucleus is pathologically developed.

In answer to the question, how deep into the eye can one look with this lamp, Dr. Blaauw said that he had seen the anterior part of the vitreous. Koeppe sees the fundus, the optic nerve and the retina with special precautions.

Dr. Bennett recalled an article by Darier published some 20 years ago, where by the use of a minus lens, endoscopic images of lens opacities were brought into view. The commonest shape of these was in the Y-form. Dr. Starr said that a plus 10 D. lens will give the same effect.

H. W. COWPER, Secretary.

### CHICAGO OPHTHALMOLOGICAL SOCIETY.

November 15, 1920.

President, DR. ALFRED N. MURRAY.

#### Retinitis Pigmentosa.

DR. GEORGE F. SUKER reported the case of Mr. R. A. P., who consulted him in July, 1914, then aged 53, on account of failing vision for near work. Family history negative, as to consanguinity and syphilis, for many generations back. Physical examination of patient negative as to syphilis, tuberculosis, rheumatism and gout. He had the usual diseases of childhood, and had not been sick for years since. Never had any eye trouble needing attention (patient's remark) excepting glasses for near work.

Upon examination July 20, 1914:

O. D. 20/20 — 0.75=20/16.

O. S. 20/30 + 0.75=20/16.

Accepts for near point + 2.50 for each eye.

Fundus examination shows typical retinitis pigmentosa, spots in each eye limited to the nasal half of each retina.

ina. The temporal half of each retina absolutely free from pigment spots and no suspicion of any chorio-retinal lesion. The pigment spots came up to the median line above and below and occupied the outer one-third of the periphery of each nasal retina. Each optic nerve absolutely normal as to color and vascularization. The characteristic waxy color of the disc definitely and distinctly absent.

The vitreous was free from any kind of opacities; lens normal; iris reactions normal. The field of vision for each eye showed in temporal field large, almost coalescing scotomata, a temporal hemianopsia. Form and color fields restricted in temporal field to about 35, and to about 45 in nasal field of each eye.

Patient stated that he never could see well at night, and did not now. Night vision was not any worse than it was 40 years ago. He was wearing +1.50, each eye, when examined, and now accepted in each eye +2.50. No treatment was deemed advisable and none given. Patient returned in October, 1920, for change in lenses. Examination showed O. D. 20/30 + 1.00=20/16; O. S. 20/40+1.25=20/16 and +4.00 each eye for near point.

There now were typical pigment spots in the temporal half of each retina, thus giving a complete circle of pigment spots. This circle of pigment did not encroach any further towards the optic nerve than did the pigment on the nasal side in 1914. Again the disc did not show any waxy appearance. The balance of the retina was not involved, the choroid showed no pathology whatsoever, and the media were clear. The field of vision for each eye showed the same type of scotomata as did the temporal field in 1914, and they coalesced in about the same manner.

The fields taken in 1920 do show that contraction has progressed slowly. No treatment of any kind was ordered.

The interesting features in this case are:

1. Absence of any of the usual supposed causes for retinitis pigmentosa.

2. The involvement of one-half of

each retina for years (some 50 odd) before the other half became similarly involved.

3. The absence of the classic waxy discs.

4. The retention for years of normal vision.

5. The relatively little annoyance caused by the nyctalopia and the symmetrically contracted visual fields—patient thinking himself normal except for nyctalopia.

**DISCUSSION.** Dr. Michael Goldenburg had never seen a case where the vision did not gradually decrease. The so-called improvement seen when one tries to treat these cases was, in his opinion, purely psychic. If sufficient enthusiasm was manifested by the doctor and sufficient armamentarium resorted to, improvement would result, but only mental. Cases would remain stationary only for a comparatively short time.

He believed that retinitis pigmentosa was a congenital defect. He was inclined to think that it was present, or the factor or factors that resulted in this condition, were present at birth. He had invariably found other congenital defects associated in these cases, e. g., stationary opacities of the lens and vitreous, colomboa of the lens, deaf mutism, and in one case he recalled the presence of polydactylism. The fact that it was not recognized early in life was due to our method of examination of children. He recalled one case of chorio-retinitis where the proliferation of pigment epithelium assumed the bone corpuscle form and was anterior to the retinal vessels, and limited to the periphery of the field, but only on one side. This case was under observation and discussion for some time and was eventually proven to be syphilitic.

Retinitis pigmentosa is a degeneration of the nerve fiber layer of the retina, with proliferation of pigment epithelium. The findings invariably were a narrowing and straightening out of the vessels, particularly the arteries. The bone corpuscle pigment deposits anterior to the vessels and the so-called waxy appearance of the disc were

referred to by the Germans as a retinitic optic atrophy.

He would be very suspicious whether this was a case of retinitis pigmentosa, regardless of the pigmentation. The waxy appearance of the disc was important. The contraction was indefinite. The pigment epithelium proliferated usually at the periphery. The contraction of the field began at the periphery, as did degenerations. As to consanguinity, he had never been able to trace a single case where he could say it was the etiologic factor. Dr. Gamble presented such a series before the society some time ago.

Dr. Francis Lane stated that the classic anatomic description of retinitis pigmentosa was that the tissue of election was the choroid. That theory was held for a good many years, but recently it had been advanced that the primary lesion was a degeneration of the rods and cones. He was very glad that Dr. Suker laid stress on the fact that the primary lesion was in the retina.

The proliferation of the pigment in typical cases began at the equatorial region. This was the location where the pigment epithelium of the choroid was first developed. The macula lutea was the last place involved in retinitis pigmentosa. There must be a degeneration of the rods and cones before the peripheric pigment could migrate into the retina, because the outward limiting membrane was more or less of a closed membrane. It was possible the first rods and cones that were developed were those at the equatorial region, because as the eyeball developed, the rods and cones developed more toward the central region.

There was not any satisfactory explanation for the nyctalopia, with this exception, that the changes took place in the retina, where the eye was most susceptible to light, in the region of five to twenty-five degrees from the posterior pole. He did not think it was very difficult to separate those cases where the vessels were involved. He had specimens that showed where there was a sclerosis of the choroidal vessels. If the pigment migrated from

any inflammatory process, it was always heaped up. It was not the fine, feathery arrangement one found in retinitis pigmentosa. The changes in the choroid from degeneration and from any inflammation showed a different picture.

Dr. Thomas Faith stated that Dr. Suker's hypothesis of the endocrine disturbance seemed to be supported by the spotted pigmentation of the skin, which occurred with hypoadrenia. The similarity in the development of the structures of the retina and the structures of the skin would lend some support to the idea that the disturbance might be thru either. What one was at fault primarily, no one could say, because they worked together.

Dr. Suker, in closing, stated that in many of these pigmentosa cases it was difficult to say whether or not the pituitary gland or some other endocrine gland might be held responsible for a certain amount of changes. He had come to the conclusion some were. If one examined the retinitis pigmentosa cases from a general viewpoint he would find some disturbances which could be analyzed as having some pathology based upon an endocrine gland disturbance. They presented either hyper- or hypopituitary or hyper- or hypothyroidism, or hyper- or hyposuprarenal activities and changes. One had the skin disturbance as manifested by the scaly skin and also the myxedematous symptoms, such as swollen face and hands and other symptoms allied to myxedema or acromegaly in a modified type. In the case cited he found disturbances that were akin to those brought about because of faulty activity in that gland. He had always held the opinion that it was a purely retinal disease and not secondary to some form of choroiditis.

As far as attenuation of the vessels was concerned, that was a secondary manifestation because of the development of the pigment upon them and a subsequent fibrosis. One would find in the majority of these individuals an element of vessel sclerosis, in a measure due to the direct contraction influence exerted by the pigment. The at-

tenuation and the light streak along these vessels gave a relatively narrow vessel appearance. Unless one had associated disease of the cardiovascular system, the retinal vessels were scarcely ever tortuous. Arteriosclerosis manifested itself usually first in the end arteries, of which the retinal vessels were a typical example.

He was glad that Dr. Goldenburg brought up the question of consanguinity rather ironically. The endocrine glands of the lower animals did not correspond to the gland of the human in every detail by any means, except in the matter of shape. The thyroid of the dog was not physiologically the same as that of a man; nor that of an ox the same as that of a dog. They had characteristics peculiar to their own species. Even the thyroid or the pituitary gland of a negro was not exactly the same as that of a white man in its functions. He had never seen retinitis pigmentosa in a negro. There was not a case on record as far as he was aware.

#### **Microscopy of Living Eye With the Slitlamp.**

DR. ROBERT VON DER HEYDT read the paper published in full on page 171 of this JOURNAL.

DISCUSSION. Dr. Michael Goldenburg said: Examination of the limbus, its circulation, the transition from sclera to cornea, was quite a revelation. The view of the iris disclosed by this instrument was probably the most fascinating picture ever seen. The mosaic-like arrangement of the pigment, like the fibers, the crypts, the contraction and dilatation of the pupil were well worth going a long way to see. The ability to see the microscopic details, both normal and abnormal, in the living was unquestionably an epoch-making step in ophthalmology. Unfortunately, one was compelled to the conclusion that this instrument would not become very popular. It was very large, therefore could not be transported readily, and it was expensive. He was inclined to think that it would be almost limited to large clinics or large institutions, or to men who had plenty of space and time to do original work.



Dr. William A. Fisher stated that the instrument must appear complicated to others as it did to him, but it might appear very simple and practical when one knew how to use it.

Dr. George F. Suker concurred in what Drs. Fisher and Goldenburg said about this instrument. The essayist had opened up a large field. One in particular, when he spoke of the droplets in the anterior chamber producing a secondary glaucoma. These droplets undoubtedly were from a colloidal substance. If that was so, then Martin Fischer's (Cincinnati) theory was not so far afield, and acidosis could be an etiologic factor in glaucoma. Closer study of these particular droplets might determine whether they were composed of crystallizable or amorphous elements. Martin Fischer's salt solutions might, after all, be of greater value in these cases than was formerly believed.

Dr. von der Heydt, in closing, stated that in the first place, with the slitlamp a definite, continuous circulation of the aqueous within the anterior chamber might be demonstrated. The solids might be observed to rise near the warm iris, and were precipitated near the cornea. It had been determined that the lines of so-called clearing, in old corneal scars continued to widen and increase during life, contrary to the common impression that in time the process would come to a standstill.

Recently he saw under slitlamp illumination an eye from which he had removed a senile cataract three years ago. It was beautiful to so distinctly see the clear membrane, holding back the vitreous, the supporting structure of the latter, and the very deep apparently optically empty space between the iris and its membrane. At one small opening the vitreous extended hernia-like forward toward the iris.

He would like to see one of the types of transient lens changes, such as were seen to exist for a short period after trauma, with the slitlamp. He had reference to that beautiful hexagonal, feather-like formation, apparently under the posterior capsule, seen after a blow, if there had not been too much hemorrhage to obscure the view. This

change, as well as the very interesting macular changes after trauma, including wrinkling of the retina, were so often overlooked. The circular ring on the lens capsule, first described by Vossius, and thought to be a lens clouding, which also followed trauma, had been studied by the slitlamp. It had been ascertained that the ring was mainly composed of blood derivatives and iris pigment, macerated on the anterior lens. To see this ring it was necessary to dilate the pupil.

Two days ago he had a foreign body case, a spicule of iron went thru the cornea and iris and lodged deeply within the lens. By the ordinary method of focal illumination with the ophthalmoscope he was unable to see the steel, because of the dense lens clouding anterior to it. With the slitlamp and microscope, and the intense illumination, he could easily see thru the clouded lens substance. Consequently, before he removed it, he was able to localize exactly the steel, determine its size, save much valuable time and the expense of a roentgenogram.

#### **Obstruction of Retinal Vessels.**

DR. JACOB LIFSCHUTZ reported the following case:

The patient, a young colored man, aged 21, came to the eye clinic of the Postgraduate Hospital on the 13th of November. He stated that sight began to fail in his right eye eight days prior to admission. He never had had any pain before, inflammation, or any other trouble in either eye. On examination the left eye was found normal in every way, vision being 20/20. The right eye had only 20/100 vision and on ophthalmoscopic examination presented the following findings: 1. A large veil-like floater in the vitreous. 2. A little above and to the temporal side of the disc, which was normal, was an area of central choroiditis, almost the size of the disc. 3. Directly above this area was an occluded retina vessel, which appeared like a white streak with some proliferation of connective tissue from it, showing a beginning of retinitis proliferans. 4. In the macular area there was the typical cherry red spot characteristic of retinal obstruction and the area sup-

plied by the inferior temporal branch of the central retinal artery was pale and bloodless, showing the presence of an obstruction in that vessel. There was no history of lues, and no Wassermann was taken. Nevertheless this was unquestionably a case of syphilis producing an interesting variety of pathologic lesions in one eye.

#### Double Cataract Operation.

DR. WILLIAM A. FISHER presented Mrs. E., aged 76, for whom he operated on both eyes for senile cataract sixteen days ago. Both eyes were bandaged nine days. She had not had any postoperative inflammation, both eyes were free from irritation, and her vision was 20/50 in each eye with a + 10. Her vision would naturally improve, and if it did not reach normal, the cause would not be faulty operation. The case was presented to elicit discussion that might prove helpful. Textbooks did not recommend the double operation; but most of the objections were made by operators of long ago. There were many advantages in certain cases and few disadvantages. Those who did not believe in it saw many disadvantages, while those who thought well of it saw few disadvantages. He saw many cases which he believed would have many advantages by having both eyes operated at the same time.

He had operated a large number in this manner and did not believe they had any more complications than those operated one eye at a time. The greatest objections to the double operation naturally came from those who had never operated in that manner. If the double operation could now be done without more complications than singly, it seemed to him that it should be the operation of choice in selected cases.

DISCUSSION. Dr. R. J. Tivnen stated that what the patient wanted and what was safe to give him was quite a different matter. Dr. Fisher's plan of extracting both cataracts at the same sitting was entirely against all teaching and practice. It seemed to him to be against all common sense. The essayist said one could do it without

risk, but he did not think you could absolutely eliminate that possibility. Dr. Fisher said he did not have infection because he used a new set of instruments for the second eye. A new set of instruments would hardly, by any stretch of one's imagination, entirely eliminate the possibility of infection. Infection might come from within, endogenous, as well as be introduced. In addition, it was to be remembered that the same operator, the same assistants, the same operating room, in short, all of the usual channels of infection were present during both the operative procedures, and all were possible factors in inaugurating an infective process.

No one, therefore, however skillful and painstaking, could possibly wholly eliminate the danger of infection under such conditions; and if infection did occur, think of the tragedy of binocular infection following the cataract extraction. Safety first, in this connection, became not only a practical slogan, but an absolute obligation on the part of the doctor in discharging his full responsibility to his patient, and his positive conviction was that operating one eye at a sitting was the sensible, practical and safest procedure.

He asked Dr. Fisher whether he performed the intracapsular operation. He understood he had done 200 on both eyes at the same time.

Dr. Adams asked as to the mental attitude of the patients. Were they as quiet with the second operation as with the first?

Dr. Fisher, in closing, said he tried to remove all senile cataracts in capsule. But in this case his needle was used in both operations and both capsules ruptured and retained, which would probably require needling. The needle, however, did not rupture all capsules. He would answer Dr. Adams' question regarding the second operation by saying he would not operate the second eye unless the patient was quiet. He had usually found the patient more quiet when operating upon the second eye than the first. He did not find many patients unruly during a cataract operation unless they were hurt. Since discarding the eye

specula and substituting lid hooks, he found the patients did not complain of any part of the operation.

When he was with Colonel Smith he operated 576 eyes and 200 of them were double. Records were kept and no more complications occurred with the 200 double than with the 376 single. If Smith had always operated as he did when he was with him, he must have operated at least 15,000 double and he believed there were no more complications doing them double than would occur operating singly. His record alone would seem to overshadow all objections.

### COLORADO OPHTHALMOLOGICAL SOCIETY.

December 18, 1920.

DR. C. L. LARUE, presiding.

#### **Uveitis of Uncertain Origin.**

W. C. and W. M. BANE, Denver, presented a woman aged 43 years who on November 22, 1920, had first noticed a blurring of the vision of the right eye. A day or two later she suffered pain in the right temple, and there was marked photophobia. On November 26 the vision of the right eye was 5/10, of the left eye 5/5. The right eye was red, vitreous haze prevented a clear view of the fundus. Atropin was instilled and the pupil dilated widely. Three days later the pupil had partly contracted, and upon again dilating it an annular deposit was found on the anterior capsule of the lens. Subsequent treatment included calomel, aspirin, and locally, the instillation of atropin and the use of hot applications. It was hard to keep the pupil dilated. On December 4 the vision of the left eye was affected, and on December 7 the vision of this eye had fallen to 5/30. Mercurial inunctions twice daily were ordered, and the patient became gradually more comfortable, but the vision did not improve. An X-ray of the nasal sinuses was negative, and so was a Wassermann test. On December 16 the right tonsil showed a slight patch of exudate, culture from which was negative.

Discussion. Melville Black, Denver, thought that the negative findings

would warrant an exploratory operation on the nasal sinuses.

Edward Jackson, Denver, agreed with Dr. Black, remarking that we did not hesitate to trephine for intracranial tension to avoid threatened blindness. It was impossible to be sure that the sinuses were normal, and the patient looked as tho she were in danger of blindness.

W. C. Finnoff, Denver: At the meeting of the American Medical Association somebody put it very well when he said the general surgeon did not hesitate to open an abdomen for purely exploratory purposes, and that we should be just as ready to do exploratory operations upon the nose and throat to determine the presence or absence of infection.

G. F. Libby, Denver: In regard to these cases and cases of sudden blindness in which we can make no diagnosis except retrobulbar neuritis, it is a good plan to say to the patient that many years ago such a case would have been hopeless, but that our present knowledge of focal infection opens up a prospect of cure in many instances; altho after we have done an exploratory operation we may fail to obtain relief.

#### **Lens Dislocation.**

W. C. and W. M. BANE, Denver, presented a man aged 24 years who gave a history of having on August 5, 1920, received a severe blow on the back of his head and a kick in the region of the left frontal sinus and left side of the bridge of the nose; and who stated that three days later he had noticed that he could not read small print with either eye, and that the distant vision of the left eye was more blurred than that of the right. There had also been a tendency of the left eye to turn outward. The vision of each eye was 5/30, improved to 5/20 with about -15 D. sph. Both lenses were dislocated downward. The question was raised as to whether the dislocation of the lenses was possibly due to the injury which the patient was said to have received.

E. F. Conant, Denver, presented a man aged 43 years, who on November 3, 1920, had received a violent blow on

the left eye with a champagne cork. There had been an immediate effusion of blood into the anterior chamber and vitreous. There was some apparent exophthalmus, with a good deal of echymosis of the lids. A dark purplish area in the sclera, from 3 to 5 mm., above the upper margin of the cornea, suggested a probable rupture of the sclera. At the time of demonstration the upper part of the iris had disappeared, being displaced upward beneath the sclera. There were brown spots on the anterior surface of the lens, and opacities in the vitreous. The right eye showed scars of an old chorioiditis, and the vision of this eye was 20/200, unimproved with a lens. The vision of the left eye was 20/100, improved to 18/50 plus with +2.50 sph. C — 7 cy. ax. 45°.

**DISCUSSION:** Melville Black, Denver, thought that the condition in Dr. Bane's case was congenital, from the appearance of a double coloboma in the right lens. There was an apparently opaque strip along the edge of one of the colobomas, but this opacity seemed to be a refractive condition.

Edward Jackson, Denver. In this case there is no sign of injury of the external coats of the eyes. There is also a coloboma in the left as well as the right eye. When I first looked at these eyes, I thought that the condition must be congenital. Then I studied Dr. Conant's patient, in whom there can be no question as to injury having caused the disturbance. This man also has a reentering crescent at the upper outer edge of the lens. In this case therefore we have a subluxation of the lens, which has been followed by some absorption at the lens margin. This shakes my diagnosis in Dr. Bane's case, for the same appearance is present in both patients, except that in Dr. Bane's case there is no general opacity of the lens.

W. H. Crisp, Denver, thought that the absence of any external scar, the fact that both eyes were affected almost equally, and the absence of any evidence pointing to a direct blow upon the eyeball were against the traumatic explanation of Dr. Bane's case.

Dr. Jackson. There have been well established reports of bilateral rupture of the lens at the time of hanging; and such rupture probably occurs in the majority of cases of hanging.

W. C. Finnoff, Denver. The war has brought out a number of injuries to the eye which resulted from head injuries remote from the eye. These indirect ocular injuries include subluxation of the lens. One writer explains this as due to contrecoup.

#### **Epithelioma of the Lid Margin.**

W. C. and W. M. Bane, Denver, presented a man aged 62 years who had come complaining that for the past three or four months the right eye had been bloodshot and there had been a small ulcerated area a little to the other side of the center of the edge of the right lower lid. This ulcerated area had taken the place of a small wart which had been there until about three months previously. The ulcer was about an eighth of an inch in diameter, and the underlying tissues were thickened.

**DISCUSSION.** Melville Black, Denver. This is probably an epithelioma. These cases are very easily managed. The indurated portion of the lid should be thoroly curetted, and then touched with trichloracetic acid. I first learned this from Dr. A. J. Markley. The result is very satisfactory.

Edward Jackson, Denver. There is very little doubt that this is an epithelioma, but the question arises whether it cannot be treated with less scarring by means of radium.

C. E. Walker, Denver. I have lately been in the habit of treating these cases, not with radium, but with the X-ray, following this with a radical operation which does not leave very much scarring.

#### **Neuroretinitis from Nasal Sinus Disease.**

W. C. Finnoff, Denver, presented a woman aged 44 years who during the past year had had a number of attacks of transitory blindness, which had been much more frequent since August last. She had had headaches all her life, and they had not recently increased in severity. She had been first



seen by Dr. Melville Black at the clinic on October 1, 1920, when the vision was R. 6-12ths, L. 6-60ths, and the nerve heads were swollen seven diopters. A Wassermann test was questionably positive. Another Wassermann test following provocative treatment was negative. Negative reports were also obtained as regards the urine, the spinal fluid, and the internal, neurologic, and nasal conditions. Neoarsphenamin, mercury, and iodides were pushed, but no improvement occurred.

When the patient was first seen by Dr. Finnoff at the County hospital, she could give no information regarding her previous condition, and all the examinations were repeated and the same results obtained. Three teeth were found to have root abscesses, but no improvement followed their removal. The vision on December 3, 1920, was R. 5-30ths, L. 5-60ths. The attacks of transitory blindness lasted about five minutes and occurred at about twenty minute intervals. The posterior ethmoid cells had been curetted on December 7, altho the operation was incomplete on account of profuse bleeding. There was slight improvement of vision following this operation.

On December 11 the posterior ethmoids were opened, but the sphenoidal aperture could not be found. After this second operation the vision improved very greatly, having in twenty-four hours reached R. 5-10ths, L. 5-12ths. The vision had remained good until three days before the date of demonstration, when the attacks of transitory blindness recurred. They were, however, not so frequent nor so lengthy as formerly, and there had been marked improvement in the swelling of the nerve heads.

**DISCUSSION:** Melville Black, Denver. The nerve heads in this case were like two great mounds. I had insisted on nasal operation, but the rhinologist demanded that everything should be done at the patient's own risk, and frightened her. The very remarkable improvement which has taken place certainly warrants the absolute completion of the operative procedure in

the nose. I recently had a similar case (altho there was not so much swelling of the discs), in which remarkable improvement followed cleaning out of the nasal sinuses. The improvement in this latter case is still going on, altho the operation was done a month ago.

W. A. Sedwick, Denver. The mere pulling of teeth is in many instances not sufficient. The sockets need to be cleaned out.

Dr. Finnoff. We have to be very guarded in our prognosis in these cases. I saw in the army a case in which a remarkable cure had been reported after opening of the sinuses. We saw the case again a year or so later with a return of the choked discs, and the patient died about six months later, when a postmortem examination showed a good-sized tumor in one of the silent areas of the brain.

#### **Sliding Conjunctival Flap for Extensive Corneal Wound.**

G. L. Strader, Cheyenne, Wyoming, presented a man whose right eye had, on November 24, 1920, received an irregular corneal wound about 12 mm. long, extending from the middle of the lower outer quadrant to about one o'clock, just inside the limbus. There was a large iris prolapse, and the lens was cataractous. A very large conjunctival flap was dissected loose from the upper half of the eyeball, and stitches were placed at either end of the flap. The lens was then expressed, and the sliding conjunctival flap was pulled down by means of the two stitches until it covered nearly the entire cornea.

The bandage over both eyes was sealed with collodion, and was not removed until the eighth day, the patient being perfectly comfortable in the meantime. When the stitches were removed the wound was found to be healed thruout its entire length. The vision at the date of report was 20-200ths with +10.D. sph. Among the advantages of the use of the sliding conjunctival flap in this class of cases was the fact that as the anterior chamber refilled the prolapsed iris was pulled out of the wound, making cutting off of the prolapse unnecessary.

**DISCUSSION:** E. R. Neeper, Colorado Springs. About a year ago I had a case in which a bottle of ammoniated water exploded and cut the cornea. The iris was slightly incarcerated in the wound. On the second day I made a small incision and released the iris and the iris remained free and the pupil entirely round.

#### **Retrobulbar Neuritis; Multiple Focal Infection.**

D. A. Strickler, Denver, presented a woman aged 25 years who on December 15 had complained that for the last few days the right eye had seemed as tho a "scum were over it." At that time the corrected vision was R. 20-50ths, L. 20-20ths. The margins of the right optic disc were indefinite, and the retinal veins distended, and there was a slight swelling in the macular region. On December 17 the right vision was 20-200ths, unimproved.

The patient had had rheumatism every winter for the past five or six years, with the exception of the present winter. Ten teeth had been removed in December, 1918, but the teeth had never been X-rayed. Attacks of tonsillitis had occurred from time to time. There was a discharge from the left nostril and from the throat.

A supplemental report stated that on December 20 X-ray examination indicated root infection of a number of the remaining teeth, especially of the first upper left molar. The shadow of the left maxillary sinus was abnormal in density, as was that of the anterior ethmoid cells beneath the left orbit. On December 21 all the upper teeth were removed, and the left maxillary sinus was found full of foul pus, which was washed out. Before the operation on the teeth and the antrum the vision of this eye had fallen to the bare perception of a hand held in front of the eye. Shortly after opening the antrum the vision returned to 20-200ths, but the fundus appearance was about the same and the vision still fluctuated more or less from day to day. Further work on the nasal sinuses was intended.

**DISCUSSION:** W. C. Bane, Denver. In examining the fundus I did not find any swelling of the optic disc. The

veins are larger than normal, and the disc appears to me paler than normal.

Melville Black, Denver. Examination of this case is not complete until a very careful field chart has been made with the campimeter.

WM. H. CRISP,  
Secretary.

#### **ROYAL SOCIETY OF MEDICINE.**

##### **Section of Ophthalmology.**

Meeting of December 10, 1920.

DR. JAMES TAYLOR, President.

##### **Optic Atrophy with Leontiasis.**

MR. N. BISHOP HARMAN showed a patient the subject of leontiasis ossea, unilateral, associated with optic atrophy. The skiagrams he exhibited showed that the thickening of bone was rather diffuse. The girl had been under observation 2½ years, and the only noticeable change during that time was a slight proptosis of the right eye. The optic atrophy, however, was on the increase. There was now a slight perception of light in the nasal and temporal fields, but the sight had practically gone.

**DISCUSSION:** Mr. E. H. E. Stack (Bristol) spoke of a case he had in 1900, the leontiasis affecting the whole head. It had been slowly growing 21 years. He secured half the skull after death, and the noticeable feature was that none of the foramina at the base of the skull were even slightly affected, altho vault and face were greatly involved in the change. It was a diffuse bossy leontiasis. At one spot the skull bone was 3 inches thick. There was no interference with brain or nerve function. During visits to a department of the hospital it had been assumed to be a case of hydrocephalus. Death eventually took place from diphtheria. Her head had become so enormous that her forefingers had become dislocated outwards from continually supporting the head, which was her usual resting attitude.

The president considered the special interest of the case was the optic atrophy. He remembered only one similar case, that of a gentleman he saw 12 years ago, who used to come to London every year to procure a

larger hat. The subject felt the increasing weight of his head. He was also deformed in certain other ways. He had no headache or optic atrophy; the latter he considered a rare complication.

#### **A New Scotometer.**

MR. HARMAN also demonstrated a new scotometer, the chief features of which were the taking of a record on carbon paper, the speed and accuracy with which it could be done, and the hiding of the observer's hand from the patient. Successive observations could be taken on the same chart, which extended  $26^\circ$  laterally, and  $17^\circ$  vertically, each way.

#### **Frame for Hyperphoria.**

He showed, in addition, a frame with vertical adjustment for use in observations on hyperphoria. He said that in certain cases which had unequal eyes there was a false hyperphoria, due to the prismatic action of lenses, which it was difficult to correct for near vision. In this apparatus, one limb was detached from the frame and connected by a telescopic arrangement with a rack-and-pinion, enabling one cell to be shifted above the other. There was a range of 10 mm., enough to give correction for ordinary hyperphoria.

#### **Peter's Campimeter.**

MR. W. H. McMULLEN exhibited a Peter's campimeter, which he described. The obvious criticism was the very short working distance, and the fact that the field marked out was in the observation of the patient. There were some cases in which it might be useful.

#### **Leprosy of the Conjunctiva.**

MR. H. NEAME showed a case of leprosy involving the conjunctiva. He said it was a rare kind of case: the last he could find recorded in England were two by Mr. Treacher Collins in 1909, reported in the Transactions of the Ophthalmological Society. The patients were father and son, aged respectively 45 and 15, of Polish nationality, tho the father had left that country twenty years before, and had noticed nothing amiss with his eye until five years before being seen by Mr. Collins.

The boy had had it only two years, and his condition was much more severe. The infection of the patient now being shown occurred in India, and the first indication of the disease was the occurrence of spots on the forearm. He had now a widely extended eruption over the body. The pupils were fixed, the knee jerks brisk. The voice indicated the presence of a degree of nasal obstruction, and there was a sanious nasal discharge from the ulcerated nasal mucous membrane. In this discharge lepra bacilli were very numerous. The lids and surrounding skin were infiltrated and edematous. Vision in the right eye was 6/18, improved with a sphere to 6/12; left 6/36, improved to 6/18. There was no improvement with cylinders.

The patient had had eight intravenous injections of sodium morrhuate, but without producing any apparent reaction or improvement. Then he had injections of sodium chaulmoograte intravenously, as used by Sir Leonard Rogers, from 1 c.c. to 4 c.c. After a somewhat large injection he had a vigorous reaction two days later. Rogers had a series of very hopeful results from this treatment, especially in leprosy of three years' standing or less. The drug was supposed to act by the bacilli, in forming their capsule, absorbing some of the fatty acid, which was inimical to the bacilli's growth. He was continuing the treatment; the patient himself considered there was improvement.

**DISCUSSION:** Mr. Treacher Collins spoke of a case in a man from Rangoon, who had a completely opaque cornea on one side, and parenchymatous keratitis on the other, and he was beginning to get nodules on the sclero-corneal margin. Peritomy had been done in his first eye, and the patient thought progress of the disease was delayed by it. The speaker, at the patient's request, did peritomy in the other eye, but it did not make any difference. It was easy to diagnose ocular leprosy from the clinical appearances. Another case was in a boy from Cork, who probably caught it from his father, who had been living in Riga.

Mr. M. S. Mayou said the nasal mucous membrane seemed to be nearly always involved, and cultures from that revealed bacilli in plenty. There was no need to excise a piece of conjunctiva in order to make the diagnosis.

The case was also discussed by Mr. Gray Clegg, Mr. Leslie Paton, and Mr. Traquair.

#### **Implantation Cyst of Iris.**

MR. HINE exhibited a patient with an implantation cyst of the iris. The patient, a woman, had had the cyst for 12 years. In 1908 she had a penetrating wound at the limbus of the left eye from a blow. Iridectomy was done. A month or two later she returned with a pearly looking cyst at the site, along the margin of the coloboma. With a small cylinder she had 6/6 vision in that eye, and she experienced no trouble from the cyst. Therefore he proposed to leave it alone.

MR. McMULLEN showed a case of similar nature, with an 8 years' history; and several members recorded cases in which the results of operations for these cysts had not been good.

H. DICKINSON.

### **OMAHA AND COUNCIL BLUFFS OPHTHALMOLOGICAL AND OTO-LARYNGOLOGICAL SOCIETY.**

OMAHA, NEBRASKA.

October 19, 1920.

#### **Pathology of Canaliculus.**

DR. F. W. DEAN of Council Bluffs, read a paper on pathology of the canaliculus and its repair, which appeared elsewhere in this journal, Vol. 3, p. 883, December, 1920.

#### **Laceration of Cornea.**

Dr. Harold Gifford presented a boy of 9, showing an unusual injury. A week before he was seen he had been pulling on a wire with another boy who let go of the wire, allowing the patient's own finger to strike him in the left eye. There was a clean cut of the cornea one-eighth inch long with a prolapse of iris in the scar. The lens showed a beginning traumatic cataract.

Vision was reduced to counting fingers at two inches. The eye was becoming quiet under treatment of sodium salicylate, and a discission was to be done on the cataractous lens when the eye was quiet.

#### **Acute Conjunctivitis Following Injury.**

Dr. Harold Gifford presented a man of 40, showing an extreme degree of swelling of both lids of the right eye with pseudomembrane covering the lids and extending on the bulbar conjunctiva to the cornea all around, and several small pustules under the skin of the lids. The patient had come in two weeks before, giving a history of swelling of the lids coming on three days after something had gotten in his eye while working in the field. For the first week after he was seen the swelling of the lids was so extreme that they could be opened only a fraction of an inch. Dr. Gifford mentioned two other cases of a similar condition, one of which had come from the same neighborhood as the patient presented, all occurring in farmers, and all with similar changes forming a picture which he called "agricultural conjunctivitis." The bacteriology of the case showed a diversity of organisms, pneumococcus, xerosis bacillus and a small gram positive spore-bearing bacillus whose properties were still being worked out. None of the members present had seen a similar case.

#### **Blepharochalasis.**

DR. H. B. LEMERE reported a case of blepharochalasis in a man.

#### **Dislocation of Lacrimal Gland.**

Dr. F. W. Dean reported a case of dislocation of the lacrimal gland with resulting deformity of the upper lid due to stretching. The gland was removed and the lid shortened 3/10ths of an inch with good cosmetic result.

Some oto-laryngologic cases were presented.

The second meeting, held November 30, 1920, was largely devoted to a paper by Dr. C. W. M. Poynter, professor of anatomy, University of Nebraska, reporting original work on the development and anatomy of the tonsils.

S. R. GIFFORD,  
Corresponding Secretary.



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## EDITORIAL STAFF

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318 Majestic Bldg., Denver, Colo.

M. URIBE-TRONCOSO,  
143 W. 92nd St., New York City.

MEYER WIENER,  
Carleton Bldg., St. Louis, Mo.

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25 E. Washington St., Chicago, Ill.

CASEY A. WOOD,  
7 W. Madison St., Chicago, Ill.

HARRY V. WÜRDEMANN,  
Cobb Bldg., Seattle, Washington.

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## ACCOMMODATION WITH APHAKIA.

In the great majority of cases of aphakia, the eye has lost all semblance of accommodation; as it has after acquiring complete rigidity of the crystalline lens from age, or paralysis of the ciliary muscle. In rare cases after the extraction of cataract, the patient is able to read small print with the same glass as he uses to see clearly at a distance. A considerable number of these cases are now recorded in the literature, without any established theory of their mechanism.

Imagination has been exercised to construct hypotheses as to how such a result might be brought about, but observations are generally lacking as to how it actually was attained. Perhaps the cases that were fully studied out have not been reported; while those that remained not fully explained to the minds of their reporters have found their way into the literature.

The two communications referring to such cases, found elsewhere in this number, illustrate the general charac-

ter of such reports. There is need for more complete accounts of cases of this kind, at least the complete exclusion of the more obvious possible explanations for them.

It will be helpful to review briefly the ways best understood in which apparent accommodation of the aphakic eye may be brought about. In the first place by drawing a strong convex correcting lens away from the eye, the focus for rays passing thru it is brought forward, so that it acts like a stronger convex lens and focusses rays from a near point. This is something that aphakic patients often discover for themselves. A 10. D. convex lens gives standard distant vision when in the usual position about a half inch in front of the cornea; by drawing it about twenty millimeters farther from the cornea it will give equally clear perception of fine print held twelve inches away from it. Here is a very practical way for any patient to read with his distance glasses.

Second. By looking obliquely thru a strong convex lens, its effect is ma-

terially increased, more in the meridian of obliquity than in that at right angles to it, but substantially in all. Thus looking thru a +10.D. lens at an angle of  $30^\circ$  with its primary axis the effect of a +11. sph.  $\ominus$  +3.50 cyl. is obtained, the axis of the added cylinder being parallel to the line about which the lens is rotated. In this way a patient who had standard distant vision, looking perpendicularly thru the upper part of his correcting lens, would in effect add +1 sph.  $\ominus$  +3.5 cyl. ax.  $180^\circ$  to its strength, when he looked down  $30^\circ$  thru the lower part of his lens to read. Such assistance might well enable him to read Jaeger 2, or even Jaeger 1; and certainly ordinary newspaper print.

Third. What is supposed to be the correction for distance may be inaccurate. The glasses worn may be a few millimeters farther from the eye than those used in the trial frame when the eyes were tested, and thus be in effect an overcorrection. The cylinder may be inaccurate, one meridian of the lens being the proper correction for distance while the meridian perpendicular thereto is more nearly the strength required for near seeing. Aphakic eyes are apt to receive inaccurate corrections and the patients accept them because the vision they give is so much better than is obtained without.

Such corrections, to make them accurate, take a great deal of time, especially if attempted without use of the ophthalmometer. Full standard vision is not expected, as a rule. Rapid fatigue of the senile eye comes in and prevents the best vision; and the patient may prefer an overcorrection because it gives larger images. In this way what is supposed to be the lens best suited to distant vision is often a compromise between that and the one needed for near vision. A patient resolved to have the best possible operations done on his eyes, had one cataract extracted in Vienna and the other in Wiesbaden. He came back with good operative results, but with lenses that gave him vision of R. = 0.8. L. = 0.8. A change of 1 sph.  $\ominus$  1

cyl. in the right and 1 sph.  $\ominus$  0.75 cyl. in the left, gave vision 1.2 in each eye.

Fourth. The refraction may differ in different parts of the pupil. It is possible thus for the same lens to serve as a distance correction for one part of the pupil, and be adapted for near vision thru another part of the pupil. Aberration of the eye is an instance of this. The edge of the pupil may need a -2. D. lens, the center a +2. D. lens. In rare cases, under full cycloplegia, the lens may be varied as much as 2. D. in strength without bringing down the vision below standard. A presbyope, with low myopia, had a corneal facet opposite the center of his pupil. His vision was markedly improved by either a +1. D., or a -1. D. lens, over what he could get without lenses.

Marked differences of refraction between different parts of the pupil are almost universal after cataract extraction with iridectomy, being somewhat proportioned to the size of the corneal incision. Such differences make skiascopy especially difficult and unsatisfactory, after cataract extraction; sometimes a difference of from 3 to 6 D. may be observed between different parts of the clear pupil. Such differences, combined with the tendency of the patient to choose the lens which gives the larger image, very readily lead to the choosing of a lens with which both near and distant vision are possible.

Fifth. The effect of a small aperture, in giving fairly sharp images without accurate focussing, must be taken into account. The effect of the size of the pupil on the distinctness of unfocussed images needs more careful investigation. But a pupil 2 mm. in diameter lessens to a notable degree the blurring due to the defective accommodation; and with a pin hole 0.5 mm. in diameter, one can read the very finest type, within one inch of an eye that is focussed for parallel rays, thus neutralizing 40. D. of imperfect focussing.

Sixth. The power to correctly interpret images can be developed to a surprisingly high degree, enabling one

person to do what seems quite impossible to others. This is what enables the trained eye of the plainsman or sailor to recognize, at a glance, what untrained eyes of equal resolving power are quite unable to make out. It enables the myopic marksman to run up a good score without concave lenses, altho the target appears to him only as a most indefinite and inconspicuous blur.

Seventh. The refraction of the eye can be changed by external pressure on the eyeball. We know this can be done by pressure of the lids, or on the lids. This has been observed in some eyes in connection with tumors of the lids, and has been resorted to by patients for the purpose of improving their vision. It is very probable that such changes may be effected by anomalous action of the extrinsic ocular muscles. They have been reported in connection with operations on the ocular muscles. Some careful experimental work should be done in this direction, not to bolster up a theory, or to give plausibility to an alleged great discovery, or overthrow knowledge previously secured, but to get at the facts.

Eighth. The hypothesis that a part of the vitreous has a higher index of refraction than other parts and so can act as a convex lens, might be investigated, altho known facts appear to be against it. One part of the vitreous may be more firm than another, yet both have the same index of refraction; as do the solid cornea and the liquid aqueous.

It is not too much to ask when a case of apparent accommodation in an aphakic eye is observed and reported, certain facts should be observed and recorded in that report. These should include the exact refraction of the eye, its focal adjustment with regard to parallel rays; the maximum visual acuity obtainable, and the lenses with which it was obtainable at the reading distance, as well as the vision obtained at the reading distance with the "distance correction."

The corneal curvatures should be observed with the ophthalmometer;

and tests made to see if these are changed by pressure or while the patient is making an effort to see close. The exact dimensions of the clear pupil should be noticed; and if large enough it should be carefully studied by skiascopy to ascertain the differences in refraction of different parts of the pupil, and any possible changes brought about in the effort to see close. The ability of the patient to interpret imperfect images might also be tested by trials by blurring with lenses of known strength at a known distance. The exact distance of the lenses before the eye should be given for each test made with lenses.

We want reports, not merely that altered adjustment had occurred in the aphakic eye, or suppositions as to how it might have been brought about; but actual observations of its mechanism.

E. J.

#### GRADUATE WORK OF THE AMERICAN ACADEMY.

A short, intensive postgraduate course in Eye, Ear, Nose and Throat is to be given in Philadelphia immediately following the regular program of the American Academy of Ophthalmology and Oto-Laryngology next October. It is an innovation for the society, and its effect will be watched with absorbing interest by all who are interested in stimulating an ambition for increased efficiency in the members of our specialty.

In the short time assigned for this course, the attempt is not made, or even considered, to cover the entire field. It is not even contemplated by the committee outlining the program to endeavor to cover any one subject completely. The desire is rather to review some most important subjects, omitting the A B C's, which members of the society are presumed to possess, but emphasizing certain essentials where many of us are apt to stumble, or which we might carelessly ignore.

In addition, newer ideas and thoughts in diagnosis, methods of examination and treatment, will be condensed and demonstrated, so that these thoughts

may be more readily absorbed by visualizing thru charts, lantern slides, and other means, other than by dry reading. The demonstrators for the course have been selected for their unusual fitness for that particular line of work, and some of them stand preeminent. The round table talks planned will also serve the purpose, it is hoped, of enabling members to become better acquainted, and permit a broad discussion and exchange of thought.

Depending on the success and impression made on the members of this first departure from the usual procedure of the society, the committee contemplates expanding the idea in the future with a view of offering many short selective courses which will be more or less complete, and will enable a member to devote his entire time, for example, to muscles, pathology, operative surgery and the like. A large registration is expected and it is hoped that those who expect to take advantage of this unusual opportunity will enroll early.

M. W.

#### INTERNATIONAL OPHTHALMOLOGICAL CONGRESS.

As elsewhere announced, the dates set for the International Congress of Ophthalmology at Washington, D. C., in 1922 have been changed to one week later, April 25-29. This has been done in order to make the best possible arrangements for the hotel accommodations of the large number of members who will be in attendance.

All papers intended for presentation at this meeting must be sent to the chairman of the Committee on Scientific Business, Dr. Edward Jackson, before January 1, 1922. This is necessary in order that the papers may be printed in a pre-session volume to be distributed to the members at the opening of the Congress, and to the authors of papers and those expected to open discussions upon them before that date.

#### MEETINGS FOR 1921.

The Societe Francaise d'Ophthalmologie meets in Paris, May 3, 4 and 5.

The Annual Congress of the Ophthalmological Society of the United Kingdom will convene in London, April 28, 29, and 30.

The Oxford Ophthalmological Congress will this year convene at Oxford, July 6, 7, and 8.

The Section on Ophthalmology of the American Medical Association will meet in Boston, Mass., Wednesday to Friday, June 8, 9, and 10.

The American Ophthalmological Society will meet at Swampscott, Mass., on the coast north of Boston, June 14 and 15.

The Pacific Coast Oto-Ophthalmic Society will meet at Seattle, Wash., July 14 and 15. It has been found impractical to hold its meeting on the boat while taking a trip to Alaska.

The Colorado Congress of Ophthalmology and Oto-Laryngology will be held in Denver late in July, probably on the 29th and 30th, altho the dates are not yet definitely fixed upon.

The American Academy of Ophthalmology and Oto-Laryngology will hold its annual meeting at Philadelphia, Pa., October 17, 18 and 19, to be followed on October 20, 21 and 22 by the intensive Postgraduate program arranged by a committee appointed at its last meeting.

#### CORRECTIONS.

In the editorial of our colleague M. Uribe-Troncoso upon the classification of Cataracts, page 141, the term intended "paranuclear" was erroneously "perinuclear" in the legend accompanying the diagram used. The error was the more serious because the point made was that the opacity appeared near the nucleus, not surrounding it.

In the "book notices," p. 224, the first sentence of the first paragraph should read: In the preface the author states that: "This book aims to be a collection of facts and not of theories."



## BOOK NOTICES.

**The American Encyclopedia and Dictionary of Ophthalmology.** Edited by Col. Casey A. Wood, M.R.C., U.S.A., M.D., D.C.L. Assisted by a large staff of collaborators. Vol. XVII, pp. 12,801 to 13,544. Fully illustrated. Chicago, Cleveland Press. 1921.

This volume completes the article on Toxic Amblyopia, and carries the work to "Vertigo Paralytans," the so-called Gerlier's Disease already described in volume 7, p. 5369. As Wood's American Encyclopedia nears completion there are naturally more and more of these titles that refer one to preceding volumes; and others that are supplementary to articles that appeared in earlier volumes. One of the latter is the twenty-page article on "Trephining Sclero-corneal," by Col. R. H. Elliot, that gives the latest improvements in technic and recent data regarding this operation.

The section on toxic amblyopia, in volume XVI, began with a general review of the subject, of 17 pages, by Dr. W. H. Crisp. To this is added, mostly in the present volume, a further review (140 pages) of the literature of the subject, apparently by the editor, Dr. Wood. It is arranged alphabetically according to the name of the toxic agent. This makes the whole section of 159 pages the most complete, up to date and detailed account of toxic amblyopias that has appeared in the language. The 67 pages devoted to trachoma also consist of a general review by Dr. James Moores Ball, and many abstracts form the literature of recent years by the editor.

The section of over 80 pages on "Transmission of Radiant Energy by Various Ophthalmic Glasses and Ocular Media" is by Prof. Charles Sheard, editor of the American Journal of Physiological Optics. It deals with facts fundamental to physiologic optics, and observations likely to find important applications in the choosing and prescription of protective glasses; and the explanation of injuries which the various radiations produce. It is il-

lustrated by many diagrams, charts, tables and photographic reproductions of spectra.

Under the title "Tuberculin," the editor has given an account of the various forms of tuberculin that have been put upon the market, and the different tuberculin tests and tuberculin therapy. This is followed by a 23-page article on "Tuberculosis of the Eye" by Dr. W. C. Finnoff, which gives a general summary of present knowledge regarding this subject, the literature of which is now developing very rapidly.

The article on Tumors of the Eye, 315 pages, seems to have been written by Dr. F. Harbridge, 165 pages, and the Editor, 150 pages. It opens with a table of contents covering nearly 3 pages. It has many illustrations, among which we note one on page 13,280 purporting to show a case reported by Veasey, but which really illustrates a case of Coover's after it had become a basal-cell carcinoma. Another picture of the same case which had developed as a papilloma is shown on page 13,338. It is remarkable that in the immense amount of material here brought together, such mistakes have been so rare.

The place this volume has reached in the alphabet shows that another volume will complete the Encyclopedia. Its preparation, doubtless, is already so far advanced that nothing will now prevent or much delay the finish. In view of the enormous increase in the costs of bookmaking since the work was planned, the original subscribers are to be congratulated on a very good bargain, as well as the possession of the first real Encyclopedia of Ophthalmology to reach completion in any language. The manner in which the publisher has met his engagements is worthy of high commendation.

E. J.

**La Cirugia del Globo Ocular y Su Tecnica.** Dr. Rodolfo Guiral y Viondi. In paper, 150 pages, 86 illustrations. Havana, Rambla. Bouza & Co.

This small book, on the surgery of the eyeball and its technic, makes no

attempt to cover the subject of ophthalmic operations. Not only is its scope strictly confined to operations upon the globe itself; in most cases but a single operation of each kind is described. It takes up what its author considers the best form of each operation, and describes its technic minutely and clearly.

It is the kind of book that a young man can read and study minutely with profit, in the effort to develop his own technic for operations upon the eyeball. For such, who read Spanish or who wish to learn to read Spanish, it will be particularly valuable. To the reviewer the selection of forms of operations to be described seems in the main to be conservative and wise.

Cataract operations occupy about half the book, beginning with a section on when should a cataract be subjected to operation. After cataract operations, iridectomy for glaucoma is described, and then the Elliot and Langer operations are considered. Next the complications of iridectomy and then iridotomy are taken up. Then, under operations on the sclera, Wecker's anterior sclerotomy is described, then posterior sclerotomy and Panas' combined keratectomy, the Saemisch operation, tattooing of the cornea by injections, enucleation of the eyeball, exenteration, pterygium, the treatment of wounds of the different parts of the eye, and removal of foreign bodies from the cornea.

The book is printed in good, but highly surfaced paper. The illustrations are half-tone reproductions of photographs, showing different steps in each operation. The chief criticism of them would be that showing so much of the patient's head and the hands of the operator, the eye appears on so small a scale that it is impossible to make out details that it would be profitable to study.

E. J.

#### CORRESPONDENCE.

**The Medical Treatment of Cataract.**  
January 31, 1921.

To the Editor: In the September number of your JOURNAL Drs. Walter

S. Franklin and Frederick C. Cordes gave a very careful and interesting account of the results of their work and findings relative to "Radium for Cataracts." I read it, as also many others, with much interest. Their percentage of betterment, 84.3%, surely made its reading very interesting, and the fact of its being harmless adds much to its favor.

About twenty years ago Dr. Richard Kalish did much work with uncertain benefit to his patients, by the use of Prices' Glycerine preceded by cocaine, with massage used once a day, and gave many illustrations showing the exact conditions and results achieved. Many ophthalmologists all over the country gave it a trial, getting results better or worse, none published that I know of. Almost weekly, surely monthly, I have some patients come in my office and ask for medical treatment for the cure of cataracts. I can frankly say that my experience with Dr. Kalish's method was nil. The scarcity of radium makes its use impractical to the many. I would like to hear the reports and conclusions from some of the greater lights of our profession as to medical treatment.

JOHN S. KIRKENDALL.

Ithaca, N. Y.

#### An International Congress.

To the Editor: Owing to a misconception on the part of some as to the exact character of an *International Congress of Ophthalmology*, which is to be held in Washington, D. C., April 25-28, 1922, I am instructed by the General Committee to prepare the following notice and to request its early publication in the JOURNAL:

First, the proposed Congress is designated as an *International Congress of Ophthalmology*, which will be held under the auspices of *The American Ophthalmological Society*, *The Section on Ophthalmology of the American Medical Association* and *The American Academy of Ophthalmology and Otolaryngology*. It is an independent congress and is in no way affiliated with, or a continuation of, the regularly constituted International Congress of

Ophthalmology which has convened at regular intervals in the past, the last session of which was to take place in St. Petersburg in 1914 at the outbreak of the war.

Second, because of unavoidable complications in the arrangement of proper and comfortable accommodations for the delegates of the congress, it has become necessary to change the date of meeting from April 18-21, 1922, as previously announced, to April 25-28, inclusive, 1922.

LUTHER C. PETER,  
Secretary.

1529 Spruce St., Philadelphia, Pa.

### BIOGRAPHIC SKETCHES.

THOMAS H. SHASTID, M.D.

SUPERIOR, WIS.

HAWLEY, ALANSON WEBSTER. This well known ophthalmologist of Seattle, Wash., was born at Aurora, Ill., in 1865, a son of Sidney B. and Mary Ann Webster Hawley. He received his degree at Rush Medical College in 1891, and practiced general medicine in Chicago for ten years. In 1901 he studied the eye, ear, nose and throat at the

Royal London Ophthalmic Hospital, London, and the following year settled as ophthalmologist and oto-laryngologist at Seattle. He married September 5, 1901, at Kalamazoo, Mich., Miss Mary P. McGrail. He was attending physician to the Illinois Eastern Hospital from 1897-1901, oculist and aurist to the Chicago, Milwaukee and St. Paul Railway and to the Children's Orthopedic Hospital, Seattle, from 1918 until his decease.

Dr. Hawley was on his way home from the annual meeting of the American Academy of Ophthalmology and Oto-Laryngology at Kansas City, Mo., where he was stricken very suddenly. He died at Kalamazoo, Mich., October 25, 1920, aged 55.

The Doctor was a man of medium height, fair complexion, quiet and scholarly. He was a well known collector of rare books; and was one of the pioneer workers for medical inspection in the public schools, and in many other movements for the welfare of the community.

Dr. Hawley is survived by his widow and two daughters, also by a sister and two brothers, one of the latter being Dr. C. W. Hawley, of Chicago.

### JUBILEE VOLUME OF PROFESSOR KOMOTO.

The abstracts given below are of papers published in the volume celebrating Professor Komoto's sixty-first birthday. Some of them were prepared by the authors of the papers and some by Professor Komoto. They have been translated from the German by Dr. H. Aufmwasser.

#### Parenchymatous Keratitis Due to Congenital Lues.

G. NAKAIZUMI has made histologic examinations in a number of cases and found: The affection is a proliferating inflammation. It consists of infiltration of the parenchyma with plasma cells and eosinophiles, with proliferation of the corneal cells and immigration of leucocytes. The fibrous lamellae are often irregularly placed, or destroyed and replaced by infiltrated

cells. The epithelial layers are often irregularly thickened, and contain in many places immigrated leucocytes. The epithelial cells themselves are often occupied by vacuoles. The basal membrane is also often destroyed. The cells are often destroyed. Bowman's author considers it of importance that among 18 cases he found ten times a fatty infiltration in the parenchyma, and the fats were cholesterin and glycerinestol. He also found a fatty infiltration in the epithelial layers.

### Diagnostic Use of Fluorescein on the Cornea.

MYASHITA praises fluorescein coloring to discover and to render more distinct superficial lesions of the cornea, where oblique illumination and magnification are not sufficient for the finding of small phlyctenular and xerotic spots. The author has found that the normal human cornea is not colorable with fluorescein within sixty seconds, while with rabbits the coloring occurs after ten seconds. The human cornea is usually colored after three to four minutes, while this is possible with rabbits in thirty to forty seconds. The cornea, after coloring, needs for decolorizing a relatively long while, usually thirty minutes, and once in a while eighty minutes.

### Ferments in the Aqueous Humor.

HAYANO has previously published an exhaustive treatise on the Amylase in the aqueous humor (Vol. I, Contributions of the Medical High School in Seoul). This contribution is the second of his studies on existing ferments in the aqueous humor. The results of his examinations are related as follows:

(1) Glycolyse and Invertase were not discernible in the aqueous humors of cattle, but maltase was positive in them.

(2) Lipase and Lecithinase were negative in rabbits and cattle.

(3) The author could not find pepsinase in the aqueous humor of cattle, by means of Gruetzner's or with Fuld's methods. While tryptase could not be demonstrated in the aqueous humor of cattle and rabbits after Gruetzner's, Miller-Jochmann's or Fuld-Gross's methods, he positively demonstrated its presence with the procedure of dialysis. The demonstrations of the autolytic ferments were positive in the aqueous humor of rabbits after the same method. Polypeptoid splitting ferment was not found in the aqueous humor of cattle.

(4) Oxydase was also negative in the aqueous humor of cattle.

(5) Katalase was neither found in cattle or rabbits.

(6) Fibrin ferment was positive in the aqueous humor of cattle and rabbits. Fibrinogen could be demonstrated in the aqueous humor of rabbits, but not in the aqueous humor of cattle.

Incidentally the author made researches on the reducing substance in the aqueous humor, and came to the following conclusions: The total of the reducing substance, figured as to sugar, averaged 0.06 grams to the litre with cattle; in rabbits a little more was found; in the human being, on the other hand, a little less. In consistency it did not diminish thru hunger. While the reducing power of the aqueous humor gradually diminished, in case the aqueous humor was left in the eyeball after enucleation or the killing of the animal, it remained for a long time almost unchanged, if kept in a cold and dark place.

Furthermore, the author demonstrated that the aqueous humor from cattle and rabbits reacted as distinctly alkaline.

### Sugar in the Anterior Chamber.

HOLI has made repeated experiments according to Bang's method on rabbits and came to the following results: In healthy men sugar in the anterior chamber, 0.08 to 0.091%, while blood sugar is 0.08 to 0.095%. In healthy rabbits, aqueous humor 0.116%, blood sugar 0.100%. Sugar in the anterior chamber diminishes after death. In diabetics the sugar in the anterior chamber changes with the amount of sugar in the blood. After subcutaneous injections of adrenalin the sugar in the anterior chamber increases with blood sugar; in the beginning rapidly, then gradually, reaches its maximum after three hours, and returns after eight to ten hours to normal. Sugar given by the mouth reaches the maximum after two to three hours, and after six to eight hours the normal. Sugar in the vitreous was found more rarely than in the anterior chamber. In rabbits, with hunger, no change in the amount of sugar was discernible.



### **Leproma on the Corneal Limbus.**

ARISAWA has found in a case of leprosy an opaqueness of the cornea and at the outer lower limbus a leprosy tubercle, with whose extirpation the cloudiness of the cornea cleared up strikingly. Histologically the author found in the tubercle a granuloma, which passed over from the muscular layers of the ciliary body to the sclera. The lepra bacilli in the ciliary body were more easily demonstrated than in the scleral tissue. They were located partly within the cells and partly without. The clearing up of the cornea resulted probably from the removal of the focus and consequent to the general treatment.

### **Mydriatics and Miotics in Affections of the Cornea.**

MARUO had better results with miotics than with mydriatics, in different diseases of the cornea, especially with *ulcus serpens* and marasmic ulcerations of the cornea.

### **Posttraumatic Parenchymatous Keratitis.**

SHIMIZU's first patient, 21 years of age, injured his left eye. After seven days a parenchymatous keratitis developed. The second patient, a boy of 14, received a slight injury to his right eye with a fragment of stone at the center of the cornea; from which point a diffused opacity of the cornea gradually developed, as in the case of Komoto.

### **Linear Superficial Keratitis.**

OSAKI, practicing in the southern portion of Formosa, encountered several times a peculiar affection of the cornea, of which the characteristics were: Active injection of the bulbar conjunctiva, photophobia and epiphora; on the surface of the cornea there appeared gray white raised lines, which crossed each other, so that different network pictures resulted. The outcome in slight cases is prompt healing in seven or eight days, but it usually is two months before the condition disappears absolutely. The opacity changes into dots, and the margins become diffused, and finally become in-

visible. Histologically the author found an edematous epithelial swelling. However, only one examination was made. The author has until now seen eleven cases, and among those only one case was found in a female. Cause unknown. Eye tension normal and cornea not insensible, as in herpes.

### **Superficial Marginal Keratitis with Pseudopterygium.**

M. NOGOWA observed three cases of marginal superficial keratitis; all had pseudopterygium. The histologic condition is very similar to rodent ulcer and shows complete inflammatory changes. The epithelial layer, the superficial layer of the parenchyma of the cornea and of the conjunctiva are affected. Bowman's membrane is generally destroyed. The pseudopterygium shows a picture totally different from genuine pterygium: The epithelium is strongly exuberant; and between its cells, migratory cells in large numbers are found. Here and there ulcerated places are found. Below the epithelial layer is found a superficial layer of parenchyma, in which numerous round cells, polynuclear leucocytes, eosinophiles and plasma cells are distributed, and in which are to be found the new formed vessels. All the cases had chronic conjunctivitis and the secretion contained numerous pneumococci. These are cases observed on old Chinamen in Mukden, where the author practices.

### **Carcinoma on the Corneal Limbus.**

FUSITA observed in a man aged 74, on the left internal limbus, a carcinoma, which was partly covered by the cornea. Histologically the following was found: One sees very distinctly how the carcinoma develops from the papillae of the limbus. The cells penetrate especially along the ciliary vessels towards the center; and invade there the ciliary body and the root of the iris. The particular portion which comes to the anterior chamber becomes partly necrotic; while at the root of the iris the cells grow rapidly and deeply inward until the epithelial layer is reached, and the iris itself seems to be in progress of inflammation. The

cells, which advance toward the ciliary body, seek tissues of least resistance, and so they were observed in the space between the ciliary body and the sclera, strongly advancing far into the suprachoroidea and even in the ciliary body, thickly embedded between the muscle bundles. The pigmented epithelial layer is partly detached thru the carcinoma cells, which have penetrated to the surface.

#### **The Nutrition of the Cornea.**

N. KUMAGAI made an experimental study on the cornea of the rabbit. He found changes in the endothelium of the cornea after bringing air into the anterior chamber after emptying its watery contents. This he believes proof that the water of the anterior chamber shares in the nutrition of the cornea; furthermore, he found many oxydase granules in the endothelium.

With the thought that eserine accelerates the circulation of the aqueous humor, and by that raises the nutrition of the cornea, while atropine decreases it, the author examined the influence of both remedies on the epithelium and the endothelium of the cornea. In doing so he could not find any difference especially worth mentioning between the two. On the pathogenesis of opacities of the cornea, after cutting thru the posterior long ciliary arteries, he emphasizes the importance of the influence of damages from the margin.

Finally the author tested "the impermeability of corneal epithelium toward oxygen" (Bullot and Lor) but could not prove it.

#### **Regeneration of the Cornea.**

KUSAMA has made different examinations of cuts of the cornea; where the wound was shallow, or deep, towards perforation.

1. In the process of healing of the cornea the epithelial cells regenerate from the epithelial layers, and the parenchyma from the parenchymatous layer. But in perforating wounds the endothelial cells take part, because the posterior parenchymatous layer is developed from endothelial cells.

2. In the beginning of regeneration the capillaries come to the wound, but disappear again.

3. In the beginning the wound is glued together with a fibrin mass, and the margins of the wound are necrotic and swollen.

4. With the development of capillaries the multinuclear leucocytes come to the wound and form the inflammatory spears, which are to be looked upon as a form of degeneration of the leucocytes.

5. But real scar tissue of the wound develops from spindle cells, which are named by Salzer keratoblasts, and which are formed from permanent cells of the cornea; and which are seen plentifully at the wound, while the inflammatory spears derived from leucocytes disappear after a while.

#### **Suppurative Scleritis and Its Histologic Findings.**

MAZUMOTO: A man 48 years of age had left exophthalmos, which was caused by a fibromatous tumor of the orbit. Soon after his admittance into the hospital he developed on the same eye a severe chemosis; and later was noticed on the sclera above the cornea a scleritic focus, which soon developed pus. With this the cornea showed pus infiltration and was occupied by an ulcer. The eye was enucleated on account of panophthalmitis.

Histologically the affected area in the sclera showed suppurative necrosis with suppurative infiltration of the other tissues. Pus forming cocci were found, probably caused by gingivitis, which the patient had. The orbital tumor was a fibroma, which started from the periosteum. Soon afterwards the patient died from a purulent basal meningitis. The writer could find in the literature only a few cases (hardly 10), in which a purulent scleritis was examined histologically.

#### **Power of Accommodation of the Japanese.**

S. ISHIWARA has in 306 cases measured with his new instrument the near point at various ages. From the large number of cases a few are described:

At 10 years, =12D.; at 20 = 8.5D.; at 30 =7D.; at 40 = 4.5D.; at 50 = 2 D. With the age of 50 the near point passes infinity. The far point with the age of 40 passes infinity. The connecting lines of the near points are not simply bent, as in the charts of Donders, but in the center (about at the age of 35) is slightly bent upwards.

#### Nature of Sympathetic Ophthalmitis.

T. NAKAMURA finds: 1. In normal rabbits the injection of serum into the carotids obtained from a guinea pig immunized with uvea of rabbits, produces no visible change in the eyes. Totally different is the result produced by such injection in rabbits in which bruising of the uvea has preceded the autoimmunization. There occur in these cases very marked ciliary injection and hyperemia of the iris, and under conditions also slight plastic iritis not only at the operated eye, but also at the nonoperated eye.

2. If one injects guinea pig serum immunized with the uvea of a rabbit directly into the anterior chamber of the rabbit, there occurs without exception a high grade of plastic uveitis, while in cases where instead of immunized serum normal guinea pig serum was used there was no apparent change.

3. Immunized serum obtained from guinea pigs after injection with the vitreous humor of rabbits, acts when injected into the anterior chamber of rabbit's eyes, in the same manner as the immunized uvea serum and leads to the occurrence of a marked plastic uveitis. The facts are of great importance in the experimental studies of sympathetic ophthalmitis.

4. By injecting into the anterior chamber of rabbit eyes, guinea pig serum which was immunized against crystalline lens of the rabbit, or vitreous humor of other animals, there occurs almost no reaction, as is the case with the normal guinea pig serum.

5. For these reasons the author has advanced a new theory. This theory, which the author describes as "Autoimmunization Theory," proved itself in the teaching of sympathetic ophthalmitis distinctly, as few other theo-

ries and hypotheses. Thereby possibilities arise to find more practical ways for the explanation of complicated conditions. Sympathetic ophthalmitis may be nothing but an inflammation of the eyes induced thru autoimmunization, resulting from cytotoxic uveal antibodies.

#### Exudative Degeneration of Retina with Multiple Miliary Aneurysms.

HATA, in the University Clinic in Tokio, observed this rare case of exudative degeneration of the retina with miliary aneurysms, as accurately described by Leber and Coats. It occurred in a youth of 18, who noticed for the last three years a diminution of his vision in the right eye. When the patient was first seen, his vision had decreased so that hardly fingers could be counted at 1 meter.

The fundus showed a very marked change. The retinal surface had a cobalt-bluish appearance and was occupied with numerous whitish gray, yellowish spots, of different forms and sizes, especially in the middle larger area. But in the periphery an evenly divided not transparent gray white mass was everywhere present. Therefore, the changes were more apparent toward the periphery and were strongly visible in the posterior portions.

It was interesting to note the changes in the vessels, since numerous capillary formations were found in different places, which showed different twists and miliary aneurysm. These were occasionally grouped like grapes, sometimes placed alongside of each other, like a string of pearls, generally at the branches of the upper and lower temporal veins. Besides these changes in the vessels there were found in different places large and small hemorrhages. Retinal detachment appeared later in the diseased eye, followed by glaucoma, so that it had to be enucleated.

*Microscopic:* Retina totally detached and, on account of the exuberance of the glia, irregularly thickened; the layers were not seen distinctly, visual cells totally destroyed. There was an abundant growth of immigrated phan-

tom cells, and precipitates of cholesterol crystals into the vacuoles of the parenchyma. A section from the strongly diseased peripheral portion showed plainly the new formation of capillaries and miliary aneurysms. One often finds the aneurysms grouped, so that the tissues have the appearance of cavernoma. The walls of the aneurysms are generally very thin, here and there, rupture or obliteration of the lumen of the vessel and perivascular round cell infiltration were found.

In the subretinal space coagulated exudate was found, in which numerous pigmented fatty-granular cells of different form and size appeared. Such phantom cells were placed with preference at the posterior surface of the detached retina, so that they were massed and blended together and also preferably invaded the substance of the retina.

Furthermore, there were found in the subretinal space several fibromatous new formations, similar to the bluish white foci, which are seen clinically above the papilla. They appeared almost homogeneous but showed coiled up fibers when Mallory stain was used; the nuclei within very weak and the vessels rather sparingly. They were on the one side intimately connected with the thickened retina, but fibrous connections between the two could not be demonstrated. On the other side they were intimately connected with the connective tissue of the choroid; while the fibers of the connective tissue of the choroid were accompanied by branches of the vessels which passed over directly into the new formations. Such formations were found in the region of the macula and in various other parts.

The author is of the opinion that the affection is not a pure retinal one, as the choroid also is involved with it. One should rather call it "chorioretinitis exudativa hemorrhagica chronica," characterized thru the appearance of miliary aneurysms. The bluish glimmering thru of the affected parts is due partly to the gliomatous degeneration of the retina and to the widely expanded intra- and subretinal

pathologic exudate; and its milky white spots were nothing else than sub- or intraretinal piling up of different masses of degeneration, especially from emigrated fatty granular cells (phantom cells from the pigmented epithelial layer).

#### **Hereditary Atrophy of the Optic Nerve.**

INOUE observed a family in which many suffered from the above affection; but of which only two sisters (aged 14 and aged 13) and a brother aged 15 could be examined. In all the central scotoma was found, and partly complicated with a peripheral defect. In the X-ray pictures the author found in all an unusual enlargement of the posterior clinoid process, bent forward, and the sella turcica a little more shallow than normally. Therefore, the author believes that the affection is probably caused by the abnormal development of the sella turcica. Resulting from it, the hypophysis in the development may produce the pressure anteriorly on the chiasm; whereby the papillo-macular bundles, as the weak resisting fiber bundles, become solely affected.

#### **Primary Tuberculosis of the Papilla.**

ISHIZU had a case under observation in a soldier, who afterwards died of miliary tuberculosis. On the papilla a tuberculous inflammatory tumor was present, the retina totally detached, choroid densely infiltrated, and in the subretinal space an inflammatory exudate with numerous tubercule bacilli were found.

#### **Inflammation of Optic Nerve Due to Iodoform.**

KAGOSHIMA observed, in a boy of 15 who was treated by a physician surgically with iodoform, a disturbance of vision, in which the fundus showed slight neuritis and the field of vision showed a central scotoma. In connection with this the case had a slight paralysis of the oculomotor. The urine showed a strong iodoform reaction. In the course of convalescence the central scotoma showed at times a break upwards, as we often observe in alcohol amblyopia.



### **Retrobulbar Neuritis Caused by Sea Weed.**

T. AKATZUKA reports: A child of eight years had acute diminution of vision, after she had taken a very popular remedy (Maculi, a sea weed), against ascaris. Fingers could only be counted at one meter. The pupils were slightly enlarged, the reaction sluggish. Fundus normal, the veins only slightly enlarged. The vision became normal after a week.

### **Impaired Vision in Schools.**

NIIMI wrote on the injury to the visual power in the public school in the city of Handa.

### **Physiologic Monocular Diplopia—Examination of Astigmatism.**

CH. OGUCHI. When an emmetrope looks at the full moon, one observes the gradual appearance of a small elevation below or little to the side, and rarely above. This appearance shows itself equally in a room on a white paper disc (12 cm. broad), when you look at it from the distance of 5 meters; but naturally not as plainly, as seen in the full moon, also the variations of the elevation are not so clear. It can be seen more distinctly thru weak convex lenses, and convex cylindrical lenses horizontal, concave, cylindrical lenses vertical, and concave cylindrical lenses horizontal. On the square papers this elevation of the edge also slightly makes its appearance.

This appearance was definitely seen by Donders, Gut, Snellen Jun, Rochat, Gullstrand and Nakamura. The author is of the opinion that it was due to an involuntary partial accommodation. The degree can be judged about 0.5 to 1 D; when the eyes become tired, there appear even 3 to 4 crescents below and they oscillate constantly.

In regular astigmatism there appear in the principal meridian two elevations; there are of course, circles of dispersion. Thru its position one can also determine the direction of the principal meridian, so that the circular disc can be readily used for the examination of astigmatism.

### **Coccidia in the Conjunctival Sac.**

SAKAGUCHI found the coccidia frequently in the conjunctival sac in the inhabitants among whom he lives (Province Yamayata) and describes several methods of staining.

### **Carbonic Acid Snow in Trachoma. Animal Experiments.**

H. AKIYA treated 62 patients, mostly with remarkably good results. The carbonic acid snow was pressed upon the conjunctiva palpebrae and transitional fold for 20-30 seconds. Generally there was observed a severe inflammation, with a pseudomembrane, but without injury to the cornea. Applications were made once in 7 to 10 days, in all repeated several times.

Results: 1. The trachoma bodies were absorbed quickly or were markedly diminished. 2. Papillae disappeared or diminished. 3. Trachomatous pannus and ulcerations were generally healed, especially when particles of snow were applied for 10 seconds on the infected eyeballs and on the affected part of the cornea, which is not dangerous at all.

Acute trachoma was not cured as readily, it taking about two months. Pigmented spots with scars, which are not rare, were rendered invisible after CO<sub>2</sub> snow treatment.

Histologic examination was made several times, and with this the author could determine, that here occurred necrosis of the infiltrated cells which were in the granules and subconjunctival tissue. This was followed by inflammatory granulation in the bodies (granules), and in the other tissues, which soon were healed.

The author thinks that this therapy has a great future, that the affected tissue can be reached deeply and certainly thru the necrosis of the infiltrated cells thru freezing. It does not depend upon hyperemia and edema, as many authors, Montague and Harston believe. After application of the treatment on the cornea of rabbits there appeared depigmentation of the iris.

### **Intraocular Pseudotumor with Hemorrhagic Glaucoma.**

T. IGARASHI reports: A boy of 15 came with the symptoms of hemor-

rhagic glaucoma of the right eye. After enucleation it was found, that a detachment of the retina and a hemorrhage were present; and also, which is very interesting, there were placed near the papilla a few round, or mushroom-like, rather large connective tissue tumors. They were placed close to the atrophic choroid and seemed to have originated from the same tissue or from the pigmented epithelial layer. Such new formations, large and small, were also visible at many places. The author does not say what it is. (From the description it appears that we had here a case of retinitis exudativa hemorrhagica, as with them we often encounter subretinal connective tissue tumors.)

#### **To Measure the Color Sense with Colored Glasses.**

S. ANDO described an apparatus for this purpose.

#### **Disturbance of the Color Sense in Beri-beri Amblyopia and Retinitis Centralis.**

Y. ITOH. In Japan both the above named affections are frequent. Central scotoma is the usual complaint. The author used, in order to recognize the disturbance of color sense, a color (preisel) on the basis of the work of George Young's Threshold test (British Journal of Ophth., July-August, 1918). Relative to it in central retinitis the yellow is mostly destroyed, while in beri-beri amblyopia, as can be expected, the green is first rendered invisible.

#### **Resorption of Ultraviolet Light Thru Tissues of the Eye.**

Y. SHIODZI has on thirteen different kinds of animals, on 50 eyes, made experiments relative to the resorption of ultraviolet light rays (with iron arc light and Adam-Hilger's Quartz Spectrograph).

Results: 1. Resorption of the cornea is different according to the animal, previously no difference has been accepted. 2. Also with the lens resorption, is very different. 3. The capsule of the lens shows no resorption, contrarily the nucleus of the lens had a

great aptitude for it. 4. Aqueous of the anterior chamber and the vitreous humor show with the thickness an increase in the resorption and in addition a secretory absorption. 5. The retina shows no absorption. 6. Resorption is most powerful with the lens, then followed the cornea, the vitreous and the aqueous humor. 7. The whole eye absorbs more than the lens alone.

#### **Sarcoma of the Eyelids.**

IMANISHI has observed, on the right upper lid of a patient 25 years of age, a sarcoma, which had its origin in the tarsus, or from the peritarsal tissues. Histologically it was a leucosarcoma; which was difficult to diagnose on account of it containing blood pigment, and to distinguish from pigmented sarcoma. Otherwise the tissue was made up principally of round and short oval cells.

The author has collected from the literature 50 cases, leucosarcoma 64%, and pigmented sarcoma 36%. Leucosarcoma generally originates from the tarsus or epitarsal tissue, while pigmented sarcoma usually arises from the pigment of the connective tissue. Leucosarcoma is mostly seen in young people and pigmented sarcoma mostly observed in older people. Relating to the sex, pigmented sarcoma occurs more in women and fewer times in men.

#### **Imamikol in Syphilitic Affections of the Eye.**

HAYASHI states imamikol is an anti-syphilitic preparation, produced in Japan, which contains 27.5% of mercury. The author has seen very good results with it. Each day on the average 0.0118 of mercury is used, while in salicylat of mercury the quantity of Hg. is 0.0078, providing, that each second day an injection of a 10% solution of imamikol is made.

#### **Juvenile Form of Familial Amaurotic Idiocy.**

OKAYAMA, in a girl fourteen years of age, who died in an absolute idiotic and blind condition, examined both enucleated eyes histologically. The older sister died in a similar condition in her 16th year.

The girl was, up to her 10th year normal, there occurred cramps after bathing; from then on gradually diminution of vision was noticed, and examined by Komoto (at that time V = 1/10). Papilla pale yellowish, otherwise normal, intellect somewhat weak; and for that reason the parents were told, that a similar condition as her sister had would follow. From then on the convulsions became more frequent, insomnia and irritability increased, and with them the imbecility. In her 15th year general paralysis was noticed, finally nutrition was difficult. Death thru exhaustion. Up to that time the patient had not presented herself so the eyes could not be examined; and only after her death we were told about it and the eye enucleation was freely permitted.

Histologically the author found: that visual cells disappear completely in the region of the macula and only gradually reappear toward the periphery; the same with the external granular layer and the external reticular layer. The inner granular layer is relatively well preserved. On the other side of the papilla, inward, both granular layers are distinguishable as distinct layers. The internal reticular layer healthy. The ganglia cells are also normal but the staining in the vicinity of the macula is not good and a few appear degenerated. Fibrous layer normal. The pigmented epithelial layer in the vicinity of the macula is remarkably depigmented and the pigment had more or less penetrated into the external layer of the retina without penetrating deeper. The papilla is not atrophic. Intracerebral; the cells of the pyramids are strongly edematous and degenerated, especially in the vicinity of the calcarine fissure.

The author believes that the Sachs-Tay disease is an affection of the layers of the ganglia cells; while the above affection is a retinal disease of the external layer, so that the affections are absolutely distinct.

#### **Ring Scotoma with Monocular Diplopia in Hysteria.**

CH. OGUCHI and G. SHIMA. In a hysteric young lady of 18 the double

ring scotoma was observed; the inner ring went thru the blind spot. The condition, however, often changed, in that the external ring, or both, disappeared occasionally when the patient felt well. The double ring scotoma is a remarkable symptom in hysteria, as Wölflin said.

Furthermore, there was complaint of monocular diplopia on both sides. The false image was symmetrically on the temporal sides. In the examination with the stenopaic slit the position of the double pictures was not at first regular. But with the third examination there appeared a regularity, so that the false image in the horizontal position of the slit became always temporal and in the vertical position above; in further changes of position nasal or below. With the general improvement this sphere of the diplopia can be traced to, as the author believes, a partial spasm of the ciliary muscles which likely occurs nasalward and below.

#### **Experiments on Sodium Glycocholat and its Clinical Uses.**

K. YAMADA writes: When one puts one or two drops of the 5 per cent solution of sodium glycocholat on the conjunctiva, one notices irritation, hyperemia and edema, and on the cornea changes in the epithelium. Histologically in the parenchymatous tissue edema and enlargement of the vessels with infiltration of white blood corpuscles occur.

With subconjunctival injections, also, edema and hyperemia with infiltration of the cells especially near the vessels are found, with chemosis, hemorrhage, infiltration of white blood corpuscles demonstrable, in the parenchyma of the cornea, also infiltration of cell in iris, edema and enlargement of the vessels. This was likewise observed in the ciliary body, but in the choroid, retina and optic nerves no changes were seen.

By injecting into the anterior chamber one sees an extended inflammation: Iris strongly edematous, with cells infiltrated; anterior chamber filled with a fibrinous exudate and blood cells; likewise the parenchyma

of the cornea infiltrated with cells; the epithelial layer detached; likewise with the endothelial layer. Further back in the ciliary body, choroid and retina, large inflammatory changes and exudate in the vitreous body, and in the subretinal space. Lens cataractous. The inflammation can also be traced into the papilla and optic nerves.

By injection into the vitreous body the inflammation in the neighboring tissues is about the same, as described above. In the histologic examination of one eye, in which a 5 per cent solution was injected into the vitreous body, and the eye enucleated 20 days later, one does not see an inflammation; but a striking atrophy of the vitreous body and of the retina, with hypertrophy of the ciliary bodies and choroid, and the sclera. Consequently the posterior portion was more affected, as stated by Wessely. When fluorescein is injected in the upper vessels one observes more readily the well known Ehrlich's green line on the affected eye, compared with the other, healthy eye. The other has, in a few cases with staphyloma of the cornea, injected the above solution (3-5%) into the posterior part of the vitreous body; and has observed a shrinking, so that artificial eyes could be worn without an operation, as the author showed in photographs.

In this conjunction, it is remarkable that the author has demonstrated, that in subcutaneous injections in the frog the pigment of the pigmented epithelial layer becomes more luminous even if the frog is kept in the dark.

#### **Urotropin in Ophthalmology.**

T. SETO. The author has made relatively extended researches on the transition of urotropin into the chamber of the eye and the formaldehyd separated there. As reagent for urotropin he employed bromated water, and for formaldehyd, resorcin and potash solution. The albumin in the anterior chamber, and of the tears containing urotropin is precipitated with colloidal iron.

Urotropin, if injected into the veins of the ears of rabbits (2.0 gr. of a 50%

urotropin solution), reaches the anterior chamber immediately; and reaches its strongest concentration in the space of 30 minutes, and is secreted until four hours after the injection. But with tears it is secreted, even if it is a very weak solution, and this maximum concentration (1-4000) makes its appearance two hours after the injection.

Formaldehyd does not exist in all cases in the aqueous humor in a demonstrable concentration; for instance in artificial closing of the eyelids or hot compresses in the vicinity of the eyes, after instillation of atropin and eserine into the conjunctival sac, and after conjunctival instillation of diluted hydrochloric acid or administration of the same by mouth.

To demonstrate the bactericidal influence of the aqueous humor containing urotropin on virulent pneumococci, these two mixed media remain in the test tube 30 minutes to one hour, and are injected with negative result into the abdomen of mice.

The author could not make the above named experiment with hermitol and boroverdin, because these two remedies, even in the freshly prepared solution give the formaldehyd reaction with resorcin-potash solution.

#### **Histologic Examination in Experimental Commotio Retinae.**

MASUDA has made experiments on rabbits' eyes, in order to determine the cloudiness of the retina, observed by Prof. Berlin; and to ascertain the pathologic changes of the retina after contusion. He made use of apparatus constructed by himself, which always readily produced the expected clouding of the retina, without complication with changes in the anterior segment of the globe. After the author had made many tests on rabbit eyes in order to ascertain the best conditions to produce clouding of the retina, he examined histologically 22 typical cases. The results of these examinations are stated by the author in the following:

1. Already after four to ten minutes the white coloring of the retina became apparent, but increased gradu-



ally, and reached after two to twelve hours the maximum; then after 24 hours began to diminish and disappeared within three to five days.

2. Without exception the author could demonstrate the serous saturation of the retina and its fine folds (a subretinal liquid collected), and with it a localized rather severe hyperemia of the choroid vessels at the point of the indirect cloudiness of the retina.

3. In a few cases, in which the cloudiness, as seen with the ophthalmoscope was very apparent, there were with these changes a tearing off of the rod layer, at times with participation of the external granular layer in the vicinity of the opalescence.

4. The narrow stratum of transudate between the choroid and the retina, described by Baek and Lohmann, as consisting of a fine granular and fine threadlike mass, the author could verify only in isolated cases. Accordingly he does not agree that these changes in commotio retina are essential.

5. Denig's humpy formations were either an artificial product following the treatment, or due to postmortem changes. The author also found similar structures in normal eyes as well as in cadaveric. In addition he found a formation, which had remarkable similarity with the Denig's hump, also in the posterior portion of the retina. From this fact the author believes, that Denig's hump formation is not directly due to the commotio retinae.

6. Based on his experimental studies the author is able to accept, that the causation of the white coloring of the retina in trial eyes is due to edema of the retina, and its fine small folds subretinal gathering of fluid. These two changes are not always equally present, one or both can be more or less prominent, or may be almost absent.

7. The edematous fluid is the result of transitory traumatic paralyzed choroid vessels. This is probably proven thru the presence of localized hyperemia of the choroid vessels, corresponding to the place of the white coloring. It is also possible that the

loosening or the tearing of the retinal elements thru the contusion can promote an inhibition of the transuded fluid.

8. In order to study the process of healing of the commotio retinae, the author examined histologically the trial eyes at different time periods. After the cloudiness of the retina had almost totally disappeared it brought him to the following results:

A. If the retinal clouding disappeared totally within three days and the retina showed normal conditions ophthalmoscopically, then there are in most cases no microscopic changes apparent.

B. But in a few cases, especially in such, in which the slight clouding of the retina remained visible to the ophthalmoscope for several days, there were found occasionally microscopically the fine folds without edema of the retina. Or the retina showed a number of small tears.

C. In a few cases, in which after the total disappearance of the cloudiness of the retina, dark discoloration and vigorous pigmentation of the ocular fundus appeared, there were found more or less vigorous overgrowth exuberance of the pigmented epithelial cells, without retinal changes, or an atrophy of the retina with atrophy of the external layer of the retina, and the gliomatous exuberance of the pigment in the retina was found. In a few cases, this overgrowth of the tissues leads to adhesions between the choroid and the retina.

D. Occasionally, after disappearance of the retinal cloudiness there appear yellowish-white striae, similar to the picture of retinitis striata, which microscopically are nothing else than the detachment of the retina caused thru the fine granular mass between the retina and the choroid.

E. The author demonstrated also that in contusion of the eyeball often lesions of the posterior layers of the retina and small subretinal hemorrhages are present. He thinks that the visual disturbances in commotio retinae are due to these changes.

10. In reference to the nature of the clouding of the retina in the human eye it is the author's opinion, that we can accept with the greatest probability, that the serous saturation of the retina and the low grade subretinal transudate is the essential etiology; and that those liquid components are mostly furnished thru diffusion, without accepting the possibility of a transudate from the retinal vessels.

#### **Glaucoma and an Operative Method.**

KIRIBUCHI believes that glaucoma is due to a disturbance of compensation of the intraocular stream changes; which occurs more or less acutely in the

inflammatory form, while it occurs gradually in glaucoma simplex. Its treatment consists in the following: A flap of conjunctiva above the cornea and turning this downwards. After that he makes a broad incision with a lance in the sclera; and a large iridectomy, whereby the iris is pressed in on both edges of the wound and the conjunctival flap is replaced and sewed with a loop suture. Afterwards the eye is often pressed upon, so that the wound is burst open repeatedly, and in this manner a subconjunctival fistula is established. The author assures us, that he had during the past five years very good results in many cases.

## ABSTRACTS

**Danis, Marcel. The Early Degeneration in the Anterior Optic Pathways.** *Annales D'Oculistique*, August, 1920.

The structure of the optic nerve and tracts is revealed in a remarkable manner by the coloration methods of Weigert and Marchi. Ehrlich's and Golgi's methods also furnish important observation for anatomic study. Weigert's and Marchi's methods color the myelin sheath without modifying the axis-cylinder. Weigert's method is not applicable until a long time after the lesion. The method of Marchi does not give absolute results, as it does not color at the same time all of the myelin sheath and the coloration is influenced by the coarseness of the sheath. Golgi's method is not applicable to new-born animals, as they do not yet possess a myelin sheath. Ehrlich's blue method cannot be applied to the study of degenerative changes.

Danis verified the methods of Cajal, showing the course of the optic fibres by their degeneration and staining after enucleation and exenteration of the eye, by experimental studies upon cats. The extensive article takes up: the history, the anatomy of the nerve, chiasm and the tracts, the technic of the degeneration experiments, the normal nerve, the lesions produced one to twenty days after the injury, the mode

of degeneration, its origin and rapidity, the role of the myelin, the influences of the traumatism, the identification and course of the various fibres.

The reduced silver method of Cajal applied to the study of early degenerative changes in the anterior optic pathways of the cat, permits of the following conclusions:

In contrast to the methods of Weigert and Marchi, as prophesied by Dustin, the study of the early axillary changes by the Cajal method gives us valuable information.

There are four kinds of fibres—fine, coarse, those with irregular contours and those intermediate between these varieties. The coarse degenerate more rapidly than the fine. The degeneration proceeds in a different manner in each kind of fibres. Some degenerate early and some slowly. The process goes on in spots, not in the total length at the same time. About the twentieth day the optic fibres are completely destroyed thruout the course of the nerve. Those at the lamina cribrosa resist the process more than the coarser fibres of the optic nerve, and undergo the identical degeneration observed in the fine ones. Centrifugal fibres were observed. There were no bifurcated fibres in the chiasm of the cat. There are no interretinal fibres.

Direct and crossed fibres were seen in the chiasm and in the fillet. A bundle of direct fibres in the external edge of the chiasm and the beginning of the fillet, were originally observed. Direct fibres proceed to the medio-internal part of the optic nerve. Crossed fibres form a curve at the origin of the connecting homonymous fillet. Crossed and direct fibres form a curve at the central extremity of the optic nerve. The body of the chiasm is composed of crossed fibres, except at the beginning. Both crossed and direct fibres are intimately mixed in the fillet.

His observations were different from those of Gehuchten and Molhau as follows:

They found that the method of Marchi showed that the degeneration of the nerve fibre began at the same moment in all the length of the nerve, which is contrary to that found by the method of Cajal, where we see that the degeneration occurs in contiguous spots along the fibre. The myelin and the axis-cylinder do not degenerate in the same manner or with the same rapidity.

The following points yet remain obscure: To what is due the difference between the modes of degeneration of the coarse and the fine fibres? Why do certain fibres degenerate early and others late? He confirms the description of Cajal as to degenerative changes in the cat; and, with the aid of other methods, those which agree with Gallemaert's observations in man. They differ from those of Henschen, Bernheimer and Cramer in man, and with those of Bossalino in the cat, the rabbit and in man.

It would have been most interesting to have procured the anatomic specimens from human individuals deceased several days after an enucleation or exenteration, but the specimens were not available. It would likewise be interesting to obtain studies of recent lesions of the nerve and optic tracts, in certain maladies. His researches in coloring the cylinder axis, itself, answer the question of Koelliker, who asked to be shown the fibres passing directly through the nerve in the homonymous fillet.

H. V. W.

**Calvin C. Rush. Treatment of Myopia.** *China Medical Journal*, v. 34, 1920, p. 606.

Rush lists myopia as one of the four chief causes of two millions of cases of blindness in China. He puts trachoma first in the list, gonorrhea second, syphilis third and myopia fourth. As a result of his experience of a year in China where he had the opportunity to examine the eyes of many students, he found 58.4% myopic, a percentage, he says, approximately four and one-half times greater than would be found in an American college.

He thinks the myopia is due largely to the poor lighting in Chinese houses, schools and shops. As for treatment, he emphasizes the measures of prevention as of first importance. He advises atropin cycloplegia for examination of myopic patients every year, decreased near work for cases of high myopia, and great care in the adjustment and wearing of spectacles.

H. J. H.

**Jess, A. Permanent Injuries of the Whole Retina from Glare of Sun.** *Klin. M. f. Augenh.*, v. 64, February-March, 1920, p. 203.

A man with normal vision noted immediately after observing the eclipse of April 17, 1912, for 15 minutes with unprotected eyes, that his sight was very much impaired. Two days later V. R. = 5/10; V. L. = 5/15 with central scotoma of 10 degrees for green of left eye, which showed two dark red spots at the macula with yellow centers. On May 13th the scotoma had disappeared and in the right eye was no marked scotoma. In the course of years, vision of both eyes deteriorated. At a reexamination on November 12, 1918, there were no ophthalmoscopic changes with the usual illumination, but with red-free light both maculae showed a minimal defect with sharp serrated borders. V. R. = 5/35; V. L. = 5/20. Visual fields contracted. The perception of blue-yellow was more damaged than that of red-green. This marked hemeralopia and the early exhaustion of vision justified the conclusion that the seat of the lesion was in the neuroepithelium, in the cones and rods of the whole retina, and not in the

conducting apparatus. He believes that some functional disturbances, so far considered as neurasthenic or hysteric symptoms, may find their explanation in a disease of the rods and cones. He thinks that if recent and old cases of glaring shall be examined with regard to the peripheral borders of color perception, proofs will be gathered, that the peripheral lesions of the retina accompanying the central focus of coagulation will be a constant finding.

C. Z.

**Lampert, P. Anomaly of the Inferior Canaliculi.** *Ann. d'Ocul.*, 1920, v. 157, p. 168.

In the right eye, between the punctum and the caruncle, the canaliculus was open in the form of a groove, starting about 1 mm. from the punctum, and terminating at the nasal angle of the eye. Its borders were slightly everted. In the left eye, the groove commenced 2 mm. from the punctum, and otherwise resembled the other. The probe could be passed thru the normal puncta, the grooves, and the remaining normal canaliculi into the normal sacs. Previous operative procedure was denied.

C. L.

**Ohsaki, O. Influence of Corneal Elasticity upon Apparent Intraocular Tension.** *Nippon, Gank. Zasshi*, July, 1919.

The author studied the intraocular tension of a 41 year old patient, who had recovered from an infection of rodent ulcer on both eyes, and had been left with a thinned cornea. He found that the intraocular tension went down the more the weight was increased. Especially was this plain on the side which had the more recently recovered. So, the heavier the weight, the more certainly he obtained a value which was far lower than the normal intraocular tension. The author, therefore, believes that the physical condition of the membrane must not be forgotten in measuring the intraocular tension.

KOMOTO.

**Oswald, A. Bilateral Closure of Central Retinal Artery after Intoxication by War Gas.** *Klin. M. f. Augenh.*, v. 64, February-March, 1920, p. 381.

Oswald reports disease of the vascu-

lar system in a man, aged 34, after inhalation of gas in a bottle; which led to gradual closure of the afferent blood vessels of the retina, with subsequent degeneration of the inner retinal layers and complete amaurosis of the left, and almost complete amaurosis of the right eye. According to the anatomic investigations of Anhoff, inhalation of war gas causes easy coagulability of the blood, increased viscosity and subsequent retardation of the blood current as etiologic elements for thrombosis. The damage to the endothelia by intense immigration of leucocytes into the vascular walls is considered as an instant effect of the poison. The possibility of thrombotic closure of the capillaries and precapillary arteries was ascertained by these investigations. A pathologic factor may be intense contraction of the blood vessels thru irritation of the motor center in the medulla oblongata. The character of the ocular arteries as terminal arteries explains why they are chiefly affected, because an interruption of circulation immediately produces functional disturbances, not noticeable in other organs.

C. Z.

**Gjessing, H. G. A. Coronary Cata-ract (Vogt) and Other Lens Changes.** *Klin. M. f. Augenh.*, August-September, 1920.

Examinations of the anterior portion of the eye by intensive illumination and strong magnification reveal many unsuspected changes and lesions. The author has examined 4,768 eyes in 2,411 persons, aged from 3 months to 87 years, by the Gullstrand lamp and Czapski-Zeiss corneal microscope with full mydriasis.

It has been shown by Erggelet, Koeppe, v. Hess, Vogt, Krenger, Schurmann, Lussi, Siegrist, Wehrli and others that structural peculiarities in the anterior portion of the bulb are different in the Swiss people and the Norwegians. For instance: In the cases examined by the author there were only 15% of the so-called shagreen bodies shown in the lens in the older people. Vogt stated that these are never found earlier than the twenty-eighth year.



This shagreen formation consists of roughly grained calcified papillae with tooth-like projections of a somewhat greenish color, something like the leather of shark skin, on the external layers of the lens. It is only to be seen by oblique illumination under a high magnification. In general, the appearances found were such as were described by Vogt and his school. When there is no cataract the external layers of the lens nucleus appear to be entirely smooth.

The author does not agree with Vogt that the yellowish discoloration of the lens coming on with age is connected with any maximal hardening of the nucleus. He also does not connect this coloring with any pathologic process in the lens.

The shagreen formation in the lens is composed of epithelium and first formed on the superficial lens fibres. Koeppe's type of preglaucoma is more often observed.

Congenital, pointlike opacities without typical localization were found in about 5% of the cases, but have nothing to do with cataract formation. Cataractous changes were found in 716 of the 2,411 persons examined (29.1%), and in 644 of these (90%), there was typical coronary cataract. He found this form of cataract in three children of 6 to 10 years of age, in seven menstruating girls of 12 to 13½ years, as well as in one not yet adolescent boy. In several of these the changes were in both eyes. The greater percentage of coronal cataracts were in elderly people, in which the breaking of the continuity of the lens fibres could be seen with the beginning of the cataract, or shortly before. The cause lies usually in a lessened fluid content of the fibres.

The precataractous symptom begins about the forty-sixth year, as a radial clear cleft, as a rule lying directly under the capsule, a strongly refracting fissure, which, as age develops, in some cases, becomes opaque. The "water" fissure proceeds generally to the usual form of senile cataract. It is more often found at 45 to 50 years of life and is combined with the coro-

nary type, with which it has something genetically to do.

The examinations reveal nothing in regard to the chemical effect of light or concomitant diseases; but, contrariwise, puberty, climacteric, also the influence of gravidity in women, played a decided role in its development.

In 168 out of 387 women who were nursing children, 48.1% of lens opacities occurred; whereas in 128 out of 771 other women there were only 15.8%. The general condition likewise played a role.

The refraction and the color of the iris have nothing to do with vision. The antagonism between senile, macular changes and cataract is established. A diffuse uveitis causes hyalin degeneration and depigmentation of the iris. Indican in the urine has no relation to the pathogenesis of cataract. The tension was examined in 328 individuals over 50 years of age, by the Schiotz tonometer, and in 130 with opacities the average was 20 mm. Hg., and those without 21 mm. Hg., the average being 20.5%.

The result of the examination of the etiology of cataract by this focal illumination and high magnification, was like that of Le-Grand Nicol, who stated in 1574: "Non ergo credo omnium suffusio est eadem causa."

The essay of 31 pages is accompanied by a number of diagrams showing the visual acuity of blue and brown eyed men and women, and of those with and without clear lenses. (See A. J. O., v. 3, p. 709.)

H. V. W.

**Goldflam, S. Blindness from Methyl Alcohol.** *Klin. M. f. Augenh.*, v. 64, May, 1920, p. 684.

The prohibition introduced into Russia at the beginning of the war, led to the consumption of substitutes and adulterations for the popular brandy, mostly by methyl alcohol; and caused many deaths and sudden blindness. Goldflam observed 11 cases. Those who consumed from 200 to 260 ccm., generally died; while the majority, after taking from 40 to 80 ccm., presented visual disturbances. These were bilateral and occurred rapidly, with

immovable pupils and normal eye-ground; followed after several weeks by blindness, central scotoma, transient improvement of sight, and then again impairment or loss of vision from atrophy of both optic nerves.

Compared with other intoxications, that by methyl alcohol resembles most amaurosis from filix mas, which, however, does not cause a central scotoma. The prognosis is very bad. If vision is once impaired, there will be no return to normal, on account of consecutive descending atrophy of the optic nerve. The often present scotoma indicates the early involvement of the ganglion layer of the retina. The primary affection invades the whole intraocular portion of the optic nerve.

Those patients, who freely vomited spontaneously or by irrigation of the stomach, fared best with vision, even if several hours had elapsed after consumption. Methyl alcohol could be detected in the organs of cadavers as late as from 48 to 72 hours after ingestion. In later stages diaphoresis thru aspirin moist heat packs and electric baths seemed useful, but a radical influence on the pathologic process in the optic nerve cannot be expected.

C. Z.

**Schwarzkoﬀ, G. Orbital Phlegmon.** *Klin. M. f. Augenh.*, v. 64, March-April, 1920, p. 240.

A farmer, aged 17, was injured by a beard of a grain which stuck in his right eye and was removed by a physician. A week later the eye became red, then painful and swollen with fever and delirium. When he was brought to the clinic, two weeks after the injury, there was exophthalmos of about 8 mm. No wound was visible, but upon eversion of the upper lid and slight pressure, pus oozed from the upper fornix. Vision was reduced to perception of movements of the hand. The fundus showed engorged veins and very narrow arteries.

On account of the serious general condition, an incision along the eyebrow was made and the periosteum detached from the upper orbital wall, without reaching a subperiosteal abscess. Only small drops of pus came

from the inflamed orbital tissue. At the dressing the next day, with further detachment of the periosteum, copious pus was evacuated. As the sensorium was very much disturbed a day later, the orbit was exenterated, with no relief. The patient died after three days.

The pus contained only staphylococci, and the autopsy revealed purulent thrombosis of the cavernous sinus, caused by thrombophlebitis of the orbital veins; and circumscribed basal meningitis of the chiasm. The pathogenesis and therapy are discussed in detail. If the location of the incision is not determined by a demonstrable abscess the method of Birch-Hirschfeld to enter at the upper orbital wall for inflammation of the retrobulbar tissue is recommended. It has the advantages of reaching a subperiosteal abscess without opening the orbital septum, and the walls of the accessory sinuses of the nose which are frequently the cause, and of better drainage.

C. Z.

**Franz, G. Lowered Tension of Eye-ball in Intraocular Tumor.** *Klin. M. f. Augenh.*, v. 64, February-March, 1920, p. 348.

Franz reports the clinical histories, and histologic findings of three cases of intraocular tumor with detachment of the retina, and decrease of intraocular tension. The anatomic examination verified the clinical diagnosis, but did not explain the occurrence of the rare hypotony in intraocular tumor. In all cases, the ciliary body was affected as the seat of the tumor, and the bloodvessels of the whole uveal tract were intensely filled. There were no inflammatory-atrophic changes, that might have led to diminished secretion of the aqueous and thus to decreased intraocular tension. All showed detachment of retina, shrinking of vitreous, but preservation of the sinus of the anterior chamber and patency of the canal of Schlemm. Whether the hypotony was caused by increased efflux of aqueous could not be determined.

Thus there are cases which do not lead to glaucomatous conditions, but to hypotony; which cannot be explained

by inflammatory complications. It is of great importance to recognize such cases in spite of the disturbing presence of detachment of the retina and to operate upon them as early as possible. (See also A. J. O., v. 3, p. 872.)

C. Z.

**Chevallerean, A., and Offret. Xeroderma Pigmentosum and Ocular Lesions.** Ann. d'Ocul., 1920, vol. 157, p. 236.

These authors report a case when the eye was involved in a lesion of the right side of the face. There was a tumor at the internal part of the sclero-corneal limbus which encroached  $\frac{1}{2}$  mm. upon the cornea and extended about 6 mm. towards the inner canthus. Diagnosis papillary epithelioma. The tumor was dissected easily, except at the limbus and the cornea, where some lamellae were removed with it. The pathologic examination of the tumor is given. Subsequently radio-therapeutic treatment was given and the patient is still under treatment. The other eye had been removed by another doctor for a tumor of the cornea and conjunctiva, which had recurred after the first removal.

C. L.

**Wiegemann, E. Technic of Trephining in Glaucoma.** Klin. M. f. Augenh., v. 64, January, 1920, 117.

For obtaining a better and safer covering of the trephine opening which will not be exposed to external influences as under the thin conjunctiva, Wiegemann devised the following modification: A thin von Graefe's knife is inserted into the limbus and after counterpuncture, 4 mm. distant, the superficial lamellae of the cornea, and a small flap of sclera and conjunctiva, 4 mm. wide, are dissected up. After lifting the flap the corneo-scleral junction is trephined and the flap placed over it. In consequence of the better covering the cushion gradually becomes flat.

C. Z.

**Hess, C. v. Limits of Visibility of the Spectrum to Animals.** Naturwiss. 1920, v. 8, p. 197-200.

Hess found in the lowest metazoa a

lack of perception of the lowest amount of light perceptible to the human eye. The sea urchin acted towards colored rays exactly as a totally color-blind man, or one adapted for dark seeing. He found that the ultraviolet rays exerted a marked influence on the movement of the caterpillar. He found in the Arthropods, that the eyes present a very high stage of development. In one form, the refracting apparatus served the purposes of (1) the collection of the visible rays, (2) the changing of the invisible short waved rays into visible long waved ones by means of fluorescence, (3) a considerable widening of the visual field by means of the fluorescence thru tangential rays, (4) by absorption of the rays of short wave length protection of the nervous substance from their deleterious effects. The vertebrates living in water possess similar borders of the spectrum to those of the invertebrates with non-faceted eyes, those who live in the air acquire a considerable extension of the border towards the rays of long wave length. In some vertebrates, there is even a shortening of the spectrum towards the violet end.

C. L.

**Behmann, A. Annular Opacity of Vossius.** Klin. M. f. Augenh., v. 64, March-April, 1920, p. 255.

Behmann described three new cases. The opacity is produced by an impression of the pupillary margin upon the anterior surface of the lens, caused by contusion, which indents the cornea and brings it and the iris in contact with the lens. By exudation of a sero-fibrous mass the pigment of the iris sticks to the surface of the lens. Behmann observed with the Nernst lamp and corneal microscope that the opacity consists of pigment particles, which he also saw floating in the aqueous and in deposits on Descemet's membrane, being identical with the single corpuscles of the ring. They could be noticed even after ten days, while remnants of blood after absorption of the hyphema are not further visible. The opacity lasts about 14 days. If longer, lesions of the lens must be assumed, which do not belong to the typical picture of Vossius' ring.

C. Z.

## NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo. Volunteers are needed in other localities.

### DEATHS

Dr. Joseph W. Bettingen, St. Paul, a member of the Minnesota Academy of Ophthalmology and Oto-Laryngology, died January 14th, aged fifty-five.

Dr. Alfred St. Clair Buxton, consulting surgeon to the Western Ophthalmic Hospital, died December 19th, aged sixty-seven.

Dr. A. Fortunati, professor of ophthalmology in the University of Rome, author of numerous works on trachoma, detachment of the retina, etc., died at the age of sixty-seven.

Dr. Charles Higgins, consulting ophthalmic surgeon to Guy's Hospital, and ophthalmic surgeon to the French Hospital, London, died suddenly on December 28th, at the age of seventy-five.

Dr. Malcolm MacLean, of Chicago, died February 11th from pneumonia, aged forty-one.

Dr. Arthur Mathewson, Washington, D. C., founder of the Brooklyn Eye and Ear Hospital, died December 31st from arteriosclerosis, aged eighty-four.

Dr. George T. Stevens, New York, most widely known for his work on the ocular movements, and especially the heterophorias, died January 30, aged eighty-eight years.

Dr. Hermann Ulbrich, of Vienna, died in Turkestan, April 1st, 1920. His work on bacteriology and postoperative infections of the eye is well known.

### SOCIETIES

The annual dinner of Past and Present Students of the Royal London Ophthalmic Hospital was held on February 10, 1921, at the Cafe Royal, Regent street.

At the February meeting of the Chicago Ophthalmological Society, papers were read by Dr. Harry Woodruff on "Bilateral Abducens Paralysis"; and by Dr. Robert Von Der Heydt on "Coronal Cataract," a common form of progressive cataract in adults.

At a joint meeting of the Chicago Neurological Society with the Chicago Ophthalmological Society, December 16th, 1920, papers were read by Dr. V. S. Counsellor and George W. Hall on "Dural Sarcoma Producing Visual Disturbances"; by Dr. George B. Hassin on "Poliocencephalitis Superior and Inferior"; Dr. E. V. L. Brown, on "The Pupil in Health" and Dr. George F. Suker on, "The Pupil in Disease."

At the January meeting of the New York Academy of Medicine, Section of Ophthalmology, papers were read by Dr. J. M. Wheeler, on "Different Types of Plastic Operations"; Dr. Martin Cohen, "Lipemia Retinalis with Hypotony in Diabetic Coma"; Dr. H. H. Tyson on "Metastatic Choroiditis following Pneumonia"; and by Dr. W. R. Broughton on "Tumor of the Iris." At the February meeting papers were read by Dr. G. E. de Schweinitz on "Concerning Ocular Conditions in Pituitary Body Disease in Syphilitic Subjects"; the discussion was opened by Drs. C. H. Frazier and Charles L. Dana.

The annual general meeting of the Ophthalmological Society of New South Wales was held at the Sydney Hospital on August 4, 1920, Dr. F. Guy Antill Pockley, the Vice-President, in the chair.

After the annual report and the financial statement had been presented, it was announced that the following officebearers and members of Council had been elected for the ensuing year: President, Dr. Gordon MacLeod; vice-president, Dr. Guy Antill Pockley; honorary treasurer, Dr. J. C. Halliday; honorary secretary, Dr. J. J. Kelly; members of council, Dr. R. H. Jones and Dr. E. A. D'Ombrian.

The February meeting of the Kansas City Eye, Ear, Nose and Throat Club was held February 17th. Papers were presented by Dr. L. R. Forgrave, St. Joseph, on "Pituitary Tumor"; Dr. W. C. Proud, St. Joseph, on "Magnet Removal of Steel from the Eye"; Dr. O. P. Bourbon, on "Trichiasis and Entropion."

### PERSONALS

Dr. Kaspar Pischel, of San Francisco, has returned after a three months' European trip.

Dr. A. Gerard East has been appointed ophthalmic surgeon to the Royal Cornwall Infirmary.

Dr. C. D. Conkey, of Duluth, Minn., is spending the winter in Los Angeles, Cal.

Dr. W. C. MacFetridge has been appointed assistant surgeon to the Royal Victoria Eye Hospital, Dublin.

Dr. Hans Barkan, San Francisco, suffered a Pott's fracture while skeeing at the Winter Carnival in Truckee during the Christmas holidays.



Dr. Harrington B. Graham has been elected chairman to the Eye, Ear, Nose and Throat section of the San Francisco County Medical Society for the year 1921.

Professor Hertel of Strassburg has been appointed successor to Professor Sattler in Leipzig, and Professor Fleischer of Tübingen has succeeded Hofrat Oeller in Erlangen.

Dr. John E. Weeks and Mrs. Weeks, of New York City, sailed from Vancouver, B. C., the first week in February for a four months' trip in which they hope to visit Japan, China and the Philippines.

Mr. J. Herbert Parsons has been elected president of the Illuminating Engineering Society in succession to Mr. A. P. Trotter. Mr. Parsons who was the first chairman of the Council of the Society, has taken a leading part in the sections in its work dealing with the influence of light upon vision, and is a member of various committees on the subject.

Dr. Casey A. Wood is now located at the Tropical Research Station of the New York Zoological Society at Kartabo, British Guiana, where he finds with congenial surroundings, much of interest to observe with regard to the animals and especially the birds and lizards of that region. He plans after visiting Dutch Guiana to go to Rio Janeiro where he and Mrs. Wood intend to sail for England where they will spend the summer.

#### MISCELLANEOUS

A donation of \$50,000 has been given to the building and equipment fund of the Eye, Ear, Nose and Throat Hospital, New Orleans, by Mrs. John Dibert.

It is announced that the Lucien Howe Prize for the best essay on some branch of surgery, preferably ophthalmology, will be awarded by the Medical Society of the State of New York at the next annual meeting, May 3, 1921. Essays should be in the hands of the chairman, Dr. Albert Vander Veer, 28 Eagle street, Albany, New York, not later than April first.

Dr. L. Webster Fox of Philadelphia was re-elected president of the Pennsylvania Home Teaching Society for the Blind. In his annual address Dr. Fox said the total number of volumes now issued is 3,948, of which 1,131 are written in Moon type. Last year there were 735 active borrowers. The publication fund of \$100,000 now amounts to \$7,586. Two recent inventions for the use of the blind were noted—the optophone and the typophonia, which it is claimed can be used readily by those who have become blind in adult life.

A graduate course in ophthalmology will be given at the ophthalmologic clinic of the Hotel Dieu under the auspices of the Paris Medical Faculty, beginning May 10 and continuing through the month of June. Prof. F. de Lapersonne and Drs. Terrien, Guillemont, Hautant, Velter, Prelai and Monburn will conduct the courses; which will include clinical examinations and practical surgical and laboratory work. A special certificate from the Paris Medical Faculty will be given on completion of the full course. The number of students will be limited to forty and the fees will total 150 francs. Physicians and students desiring to take the course should apply to the secretary of the Faculté de médecine de Paris.

The supplement to the Union Alumni Monthly for February is an historical sketch, "Union's Part in Medical Beneficence," by Dr. C. M. Culver of Albany. The biographic notices it contains are limited to deceased alumni of Union College. But it mentions that 13 of the living medical graduates of the institution, 10 per cent of the whole number, are included in "Who's Who in America." The only ophthalmologist mentioned is Thomas Featherstonhaugh, for several years Medical Referee of the Pensions Bureau. Had living doctors been included the names of the translator of Landolt's "Accommodation and Refraction," and of Alexander Duane should have been prominent in the list.

The Atlantic Monthly for January contains an article on "Germany Revisited," by J. Bennett Nolan, Esq., of Reading, Pa., in which he speaks of the renowned "Augenklinik" of Wiesbaden and its famous head. The former "seemed to be as scrupulously clean and well ordered as ever"; but of the doctor he writes: "He stood before me thin and pallid; his clothes were shiny and worn. Although he greeted me cordially enough it was evident that the iron had entered his soul." He spoke of the war and the shame and bitterness it entailed. He said his English patients were returning but he could not take them at the old rates nor have one rate for the Germans and another for the English and Americans. "One of your American houses has asked me to come over for three months, they to arrange my consultations and take ten per cent of the fees. But I will not go while I must hang my head. When we Germans are reinstated in your public opinion then, perhaps—" He spoke of vexatious restrictions imposed by the authorities in occupation, not knowing perhaps that they were copied from German proclamations found in Lille and Belgian cities.